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INDUSTRIAL MEDICINE

Industrial Health, Occupational Medicine and Traumatic Surgery

May, 1946

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Ocular Effects of Radiant Energy
— Clinical Pathological Changes —

A Health Program for the Merchant Marine
— Convalescence and Rehabilitation —

Pre-Placement X-Ray Examination
— Of the Lower Back —

The Treatment of Injuries to the Hand
— With Particular Reference to Nerve and Tendon Repair —

Sunburn
— And Industrial Absenteeism —

Psychoneurosis in Industry
— Are Psychoneurotics Employable? —

Psychologically Hazardous Occupations
— The Human Factor —

Emotional First Aid Stations in Industry
— On the Job: Off the Job —

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Volume 15 Number 5

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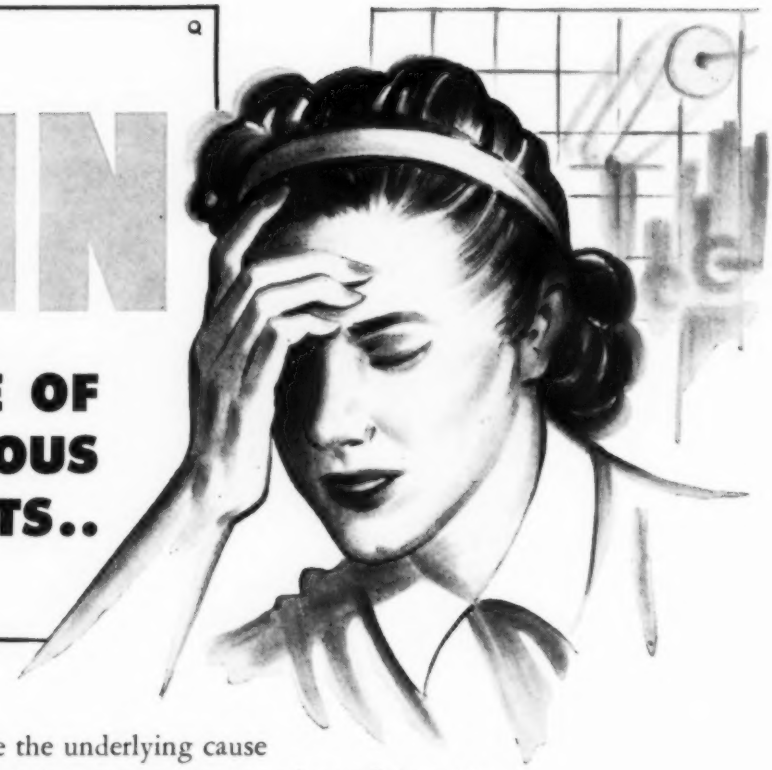

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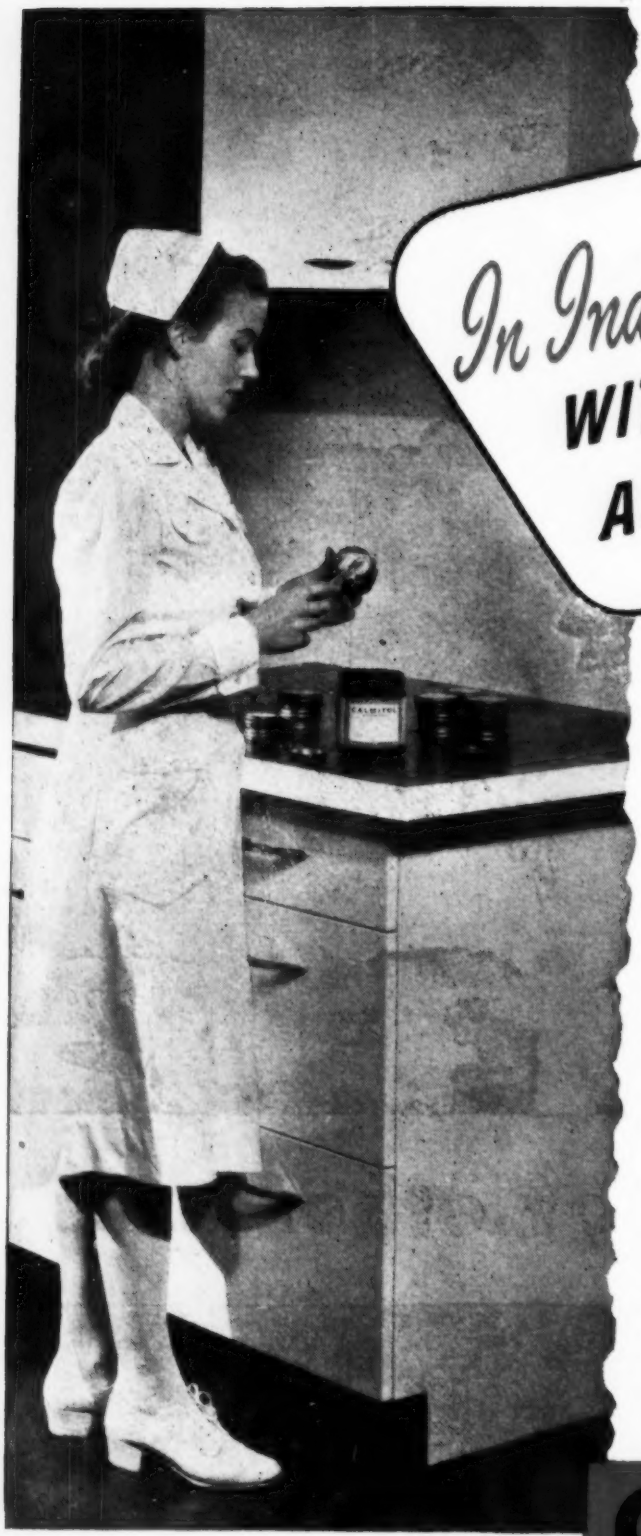

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THE presentations and discussions at the Conference on Industrial Health at Chicago last month were unusually good. Many were definitely superior, and all were characterized by technical and professional excellence. With five Associations participating, each having its own program, the number of papers which are to be published here is too large to permit their appearance in any one issue—even as to any one of the organizations. All of them, however, will be published as quickly as may be, and it is planned to have the last one in print within the year, or at least before the 1947 Conference—the plans for which are already being made. Some of the industrial hygiene papers will appear in the *Journal of Industrial Hygiene and Toxicology*. Others will feature the new publication of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION which will be published for the Association by INDUSTRIAL MEDICINE PUBLISHING COMPANY, and, beginning with July, 1946, will be issued quarterly. The decision to have its own official Journal was arrived at by the A.I.H.A. during the Conference meetings. This new Quarterly will replace the Industrial Hygiene Section which heretofore has been included every three months in INDUSTRIAL MEDICINE. The Conference articles in this issue reflect the high quality of the meeting standards. Notable are DR. KUTSCHER'S "Ocular Effects of Radiant Energy" (page 311); DR. MASON'S "Treatment of Injuries to the Hand" (page 323); DR. LEGGO'S "Industrial Relations Values" (page 330); and DR. SAPPINGTON'S "Etiology of Dental Sequelae" (page 339). Excellent as these are, those from Long Island College of Medicine's Third Post-Graduate Course in Industrial Medicine and those that are original ("Pre-Placement X-Ray Examinations of the Lower Back" by DRS. BARTON and BIRAM (page 319) for example) are good, too. . . .

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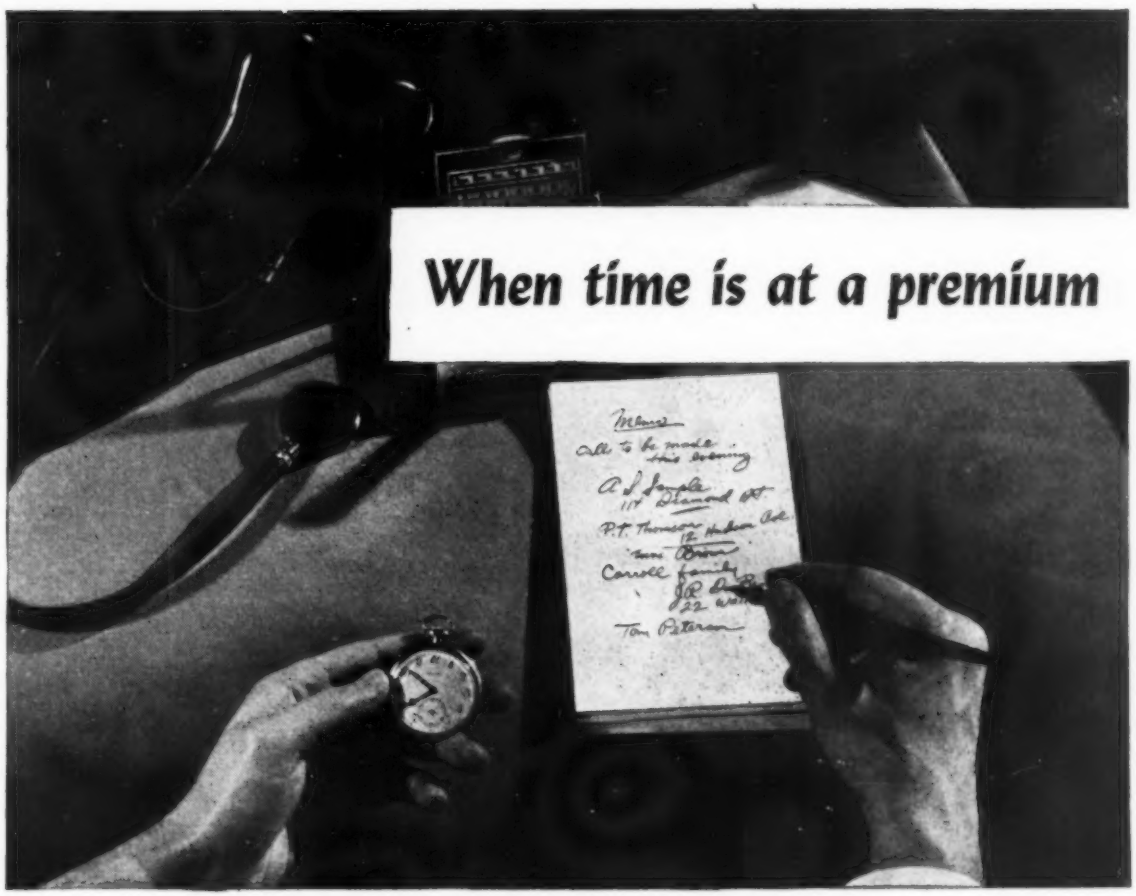

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PERSONAL

DR. RICHARD J. CAMPION, local medical officer of the Bell Telephone Company, Philadelphia, has been appointed medical director of that company. He will now fill the duties of both offices. DR. CAMPION succeeds DR. GEORGE MORRIS PIERSOL, recently retired on account of age.

JEAN S. FELTON, M.D., recently released from Army service where he was Lieutenant-Colonel, is now associated with Monsanto Chemical Company, Clinton Laboratories, at Oak Ridge, Tennessee, as Principal Physician.

DR. OTTO SWISHER, JR., of Southern Pines, has been appointed director of the Industrial Hygiene Division of the North Carolina State Board of Health, succeeding DR. C. B. DAVIS, who recently resigned.

DR. J. HUBER WAGNER, president of St. Francis Hospital, Pittsburgh, has been appointed chief surgeon of the Carnegie-Illinois Steel Corporation, to succeed DR. WILLIAM O'NEILL SHERMAN who retired after 35 years with the company. DR. WAGNER has been associated with the Carnegie-Illinois Steel Corporation since 1920 and is also on the staffs of West Penn, Magee, and Eye and Ear Hospitals. He is a past president of the Pittsburgh Academy of Medicine and was an All-American football star while attending the University of Pittsburgh.

FRIENDS and neighbors—500 of them—disregarding a temperature of 15° below zero, gathered from miles around for a party held in the high school at Willow River in honor of DR. WILLIAM C. EHMKE'S sixty-eighth birthday. Features of the program were addresses by Dr. Thomas Moe, of Moose Lake, and Dr. Paul G. Boman, of the Duluth Clinic. A biographical sketch of DR. EHMKE'S life was read, and the doctor was presented with a purse of money in appreciation of his many years of devoted service. DR. EHMKE was born in Le Sueur County. He graduated from Hamline University and took his medical degree at the University of Minnesota. Following his internship, he was made company doctor for the Atwood Lumber Company's camps in Pine County. That was more than 40 years ago. Finding the country and the people to his liking, he established a practice and has continued it ever since. The "good doc," as he is affectionate-

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—*Minnesota Medicine*, March, 1946.

Dr. Charles Francis Shook

DR. CHARLES FRANCIS SHOOK, now on terminal leave as a Colonel in the U. S. Army Medical Corps, has been appointed to the newly-created position of medical director of Owens-Illinois Glass Company, Toledo, Ohio. DR. SHOOK, who has 28 years of service, including active combat duty in both World Wars, will be in complete charge of the medical program for the company's more than 21,000 employees. A native of Omaha, Nebraska, he is a graduate of Creighton Medical College, class of 1916. During his army career, he was graduated from the Army Sanitary School, the School of Aviation Medicine, and the Army Industrial College. He spent 13 years in the military service as a flight surgeon and 10 years in New York and Washington in procurement planning for medical supplies and equipment. He was deputy chief surgeon to Major General Paul R. Hawley for the European Theater. His most recent assignment was closing hospitals in France, England, and Belgium and disposal of excess supplies. His decorations, for four battles in World War I and two in World War II, include the Legion of Merit with Cluster, Bronze Star, Officer of the British Empire, French Croix de Guerre with Palm and Brazilian Medal de la Guerre.

DR. HAROLD R. HENNESSY has been appointed assistant secretary of the Council on Industrial Health of the American Medical Association, of which DR. CARL M. PETERSON is secretary. DR. HENNESSY was recently discharged from the Army Medical Corps where he was Lieutenant Colonel. His army service covered a little more than five years, during the last two years of which he was

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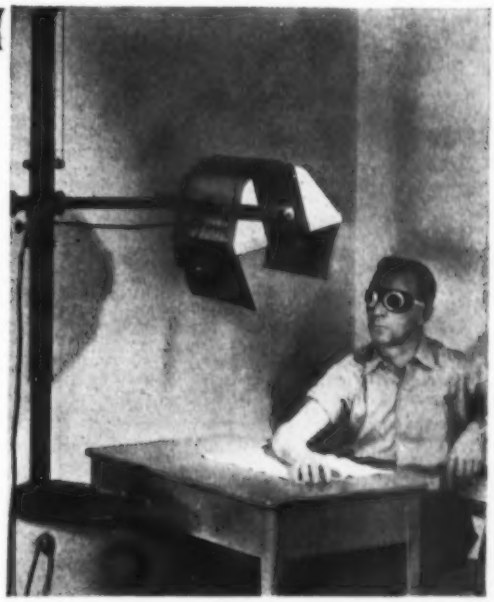

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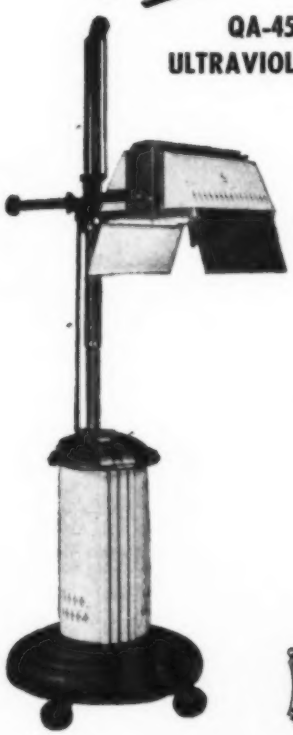

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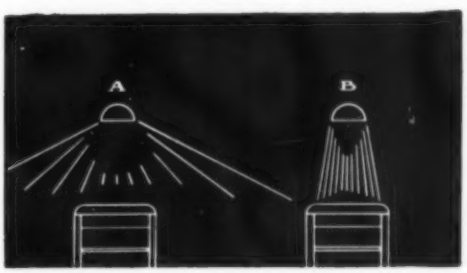

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overseas. While in this country and for a considerable period he was Industrial Medical Officer of the Ninth Service Command at Fort Douglas, Utah. DR. HENNESSEY was born in 1903; graduated M. D. from the University of Minnesota Medical School in 1930. He has had considerable public health training, and, prior to going into the Army, he was associated with the California State Health Department.

DR. T. J. KELLY has joined the staff of the Shell Oil Company, Incorporated, Wood River Refinery, as physician and surgeon. DR. KELLY is a graduate of the School of Medicine of St. Louis University and practiced in Jefferson City, Missouri, until 1942 when he joined the U. S. Army Medical Corps. He served with several units in the Army, among them the 91st Evacuation Hospital Corps assigned to the 1st and 9th Armies during the invasion and campaign in Europe. After three and one-half years of service he was discharged in February, 1946, and became associated with Shell on March 1, 1946.

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JOSEPH H. CHIVERS, M.D., is the new chairman of the Committee on Industrial Health of the Illinois Medical Association. The other members are F. P. HAMMOND, M.D., HAROLD A. VONACHEN, M.D., C. O. SAPPINGTON, M.D., DR. P.H., MILTON H. KRONENBERG, M.D., and R. I. BARICKMAN, M.D.

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THE BOOK publishing firm of W. W. Norton & Company announce that they are again inviting manuscripts for submission to be considered for the Norton Medical Award of $3500 offered to encourage the writing of books on medicine and the medical profession for the layman. The first such award was made to THE DOCTOR'S JOB, Dr. Carl Binger's book, published last spring, which gave the doctor's point of view on his work. Announcement will be made shortly of the winning book for 1946. Closing date for submission of manuscripts this year is No-

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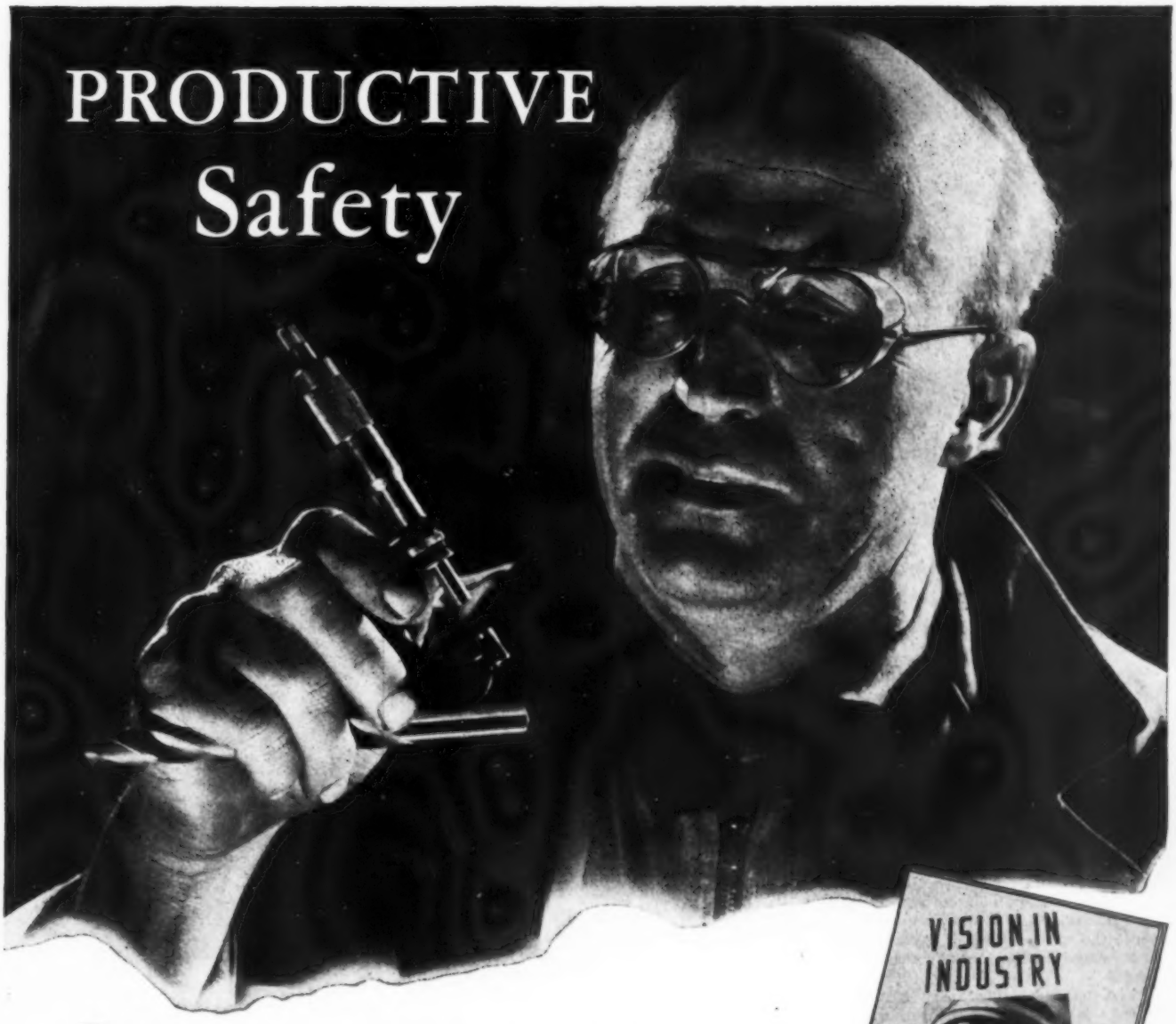

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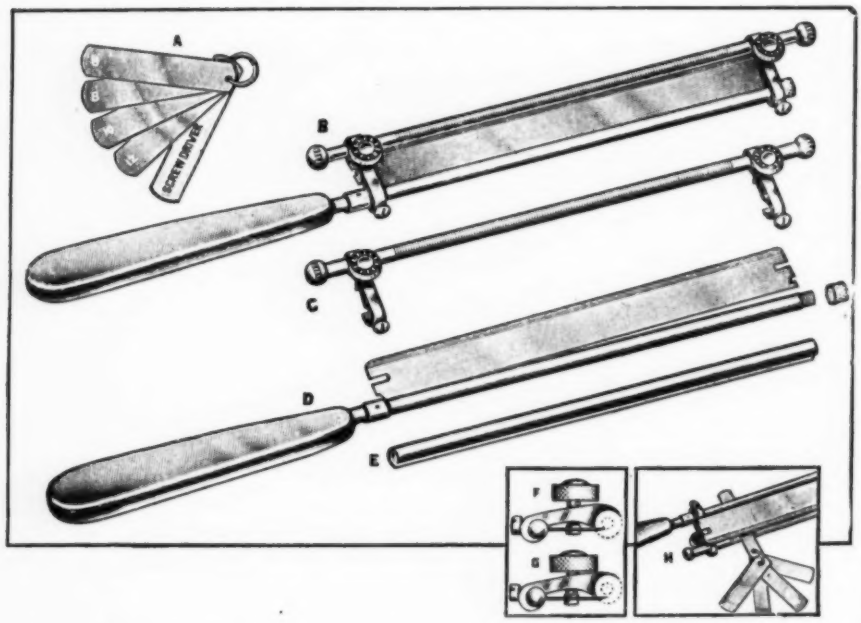

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Wisconsin Program

AN INDUSTRIAL health program, which it is hoped will be generally adopted by Wisconsin industries in cooperation with county medical societies, has been studied and the groundwork for it has been prepared by the Committee on Industrial Health, working for the past several months under the chairmanship of DR. D. E. DORCHESTER, of Sturgeon Bay. Meeting the latter part of January, the committee gave special study to the outline of qualifications for various types of industrial nursing positions, description of duties, and recommended administrative policies for industrial nursing services, as prepared by the Industrial Nurses Section of the Wisconsin State Nurses Association and presented to the committee by MISS CATHERINE CHAMBERS, R.N., of the Bureau of Industrial Hygiene, State Board of Health, and temporary chairman of the section. The comprehensive classifications of types of positions, and specific outline of desirable qualifications, duties, and administrative policies were approved by the committee after minor revisions were made. DR. PAUL BREHM, director of the Bureau of Industrial Hygiene, who met with the committee, stressed the need to have general acceptance of basic principles indicating the relationship of the physician to the entire industrial health program. He presented for study and modification a suggested draft of principles indicating the necessity of having county medical societies assume a prominent role in the development of industrial health programs, as well as the relationship of the individual plant physician to other physicians in the community. "Kenosha County physicians have given us a good start on a sound industrial health program," said DR. BREHM, referring to the plan carried out at the Snap-on-Tools Corporation, Kenosha (INDUSTRIAL MEDICINE, 14:3, 184-188, March 1945), "and we feel sure many other industries in the state will follow the lead of medicine if we come forward with a well-thought-out plan which will convince top management that an industrial health program will be good business as well as making employment in their plant more attractive to workers." All of the material thus far developed by the committee or given its approval has been submitted to the Council on Industrial Health of the A.M.A. for review and coordination with accepted principles adopted by the national organization for the entire country. Speaking of the development of a program on a state-wide level, DR. DORCHESTER said that "top management will accept our ideas if they meet the 'dollar and cents' standards of Wisconsin industrial leaders. . . . Industrial leaders of the state cannot be approached on the idea of employing nurses and special medical care under the idealism of paternalism. We feel confident, (and many industrial leaders in the state agree with us) that a well-planned industrial health program, worked out in cooperation with the county medical society involved, can result in better employee efficiency, with resultant profits to management."

—In "The Medical Forum," *Wisconsin Med. J.*, March, 1946.

Congress on Physical Medicine

THE American Congress of Physical Medicine will hold its 24th annual scientific and clinical session September 4, 5, 6 and 7, 1946, at the Hotel Pennsylvania in New York. Scientific and clinical sessions will be given each day. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction courses will be held September 4, 5 and 6. These courses will be open to physicians and to therapists registered with the American Registry of Physical Therapy Technicians. For information concerning the convention and the instruction course, address the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago.

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1. Lehr, D.: Proc. Soc. Exper. Biol. & Med. **58**:11, 1945.
2. Lehr, D.: In press.

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That everyone, and especially industrial workers, should eat a good breakfast is emphasized by all nutritionists. A basic breakfast pattern of fruit, cereal with milk and sugar, bread and butter, and a beverage provides balanced nutriment and caloric food energy to start the day, and is easily augmented by other suitable foods if caloric needs are higher.

The inclusion of cereals—whether ready to eat or to be cooked—in this basic breakfast pattern is a reflection of their balanced nutritional composition. They are highly palatable, readily digested, always plentiful. They never tax the palate since large variety is available from which to choose. The important contribution made by the cereal dish, consisting of 1 oz. of cereal (whole grain, enriched, or restored to whole-grain values of thiamine, niacin, and iron), 4 oz. of milk, and 1 teaspoonful of sugar is indicated by the table of composite averages:

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Protein	7.1 Gm.
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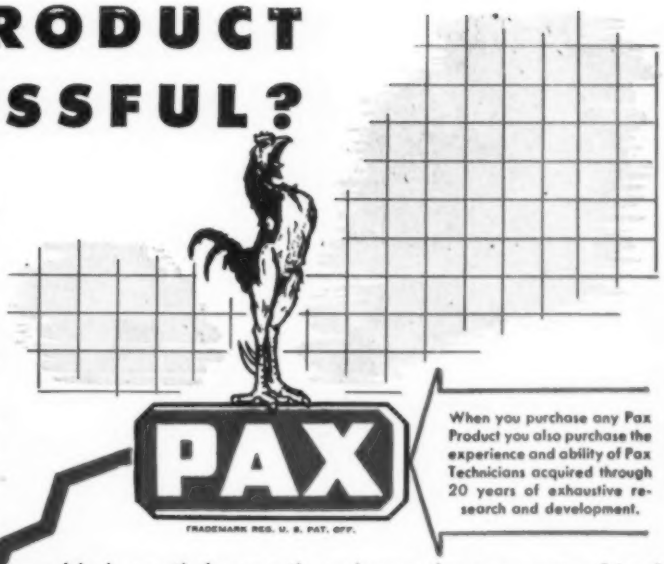

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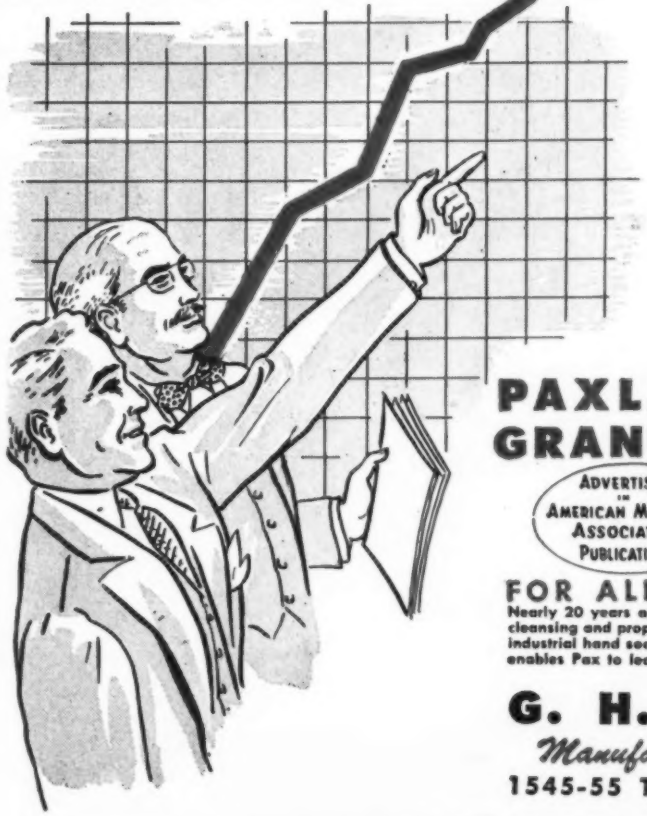

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Ringer's 1000 cc		.084	5781	485.60
Normal Saline 300 cc		.061	2436	148.60
5% Hyper tonic Saline	200 cc	.066	228	15.05
15% " " "	500 cc	.083	30	2.49
5% Dextrose in Ringer	1000 cc	.105	2421	254.21
10% " " "	500 cc	.101	1713	173.01
2½% " " "	500 cc	.087	36	3.13
10% Dextrose in Distilled Water	1000 cc	.108	21	2.27
5% Dextrose Ditto	1000 cc	.100	15	1.50
4% Boric Acid 750 cc		.072	3786	272.59
2½% Sodium Citrate	100 cc	.063	1779	112.08
10% Sodium Lactate	500 cc	.206	111	22.87
Distilled Water	30 cc	.061	1086	66.25
Distilled Water	50 cc	.061	252	15.37
Distilled Water	500 cc	.065	720	46.80

HOW STERILIZED: Autoclave, 15 pounds 30 min. 250° F.

REACTIONS REPORTED: None

FACTORS used to compute unit cost:
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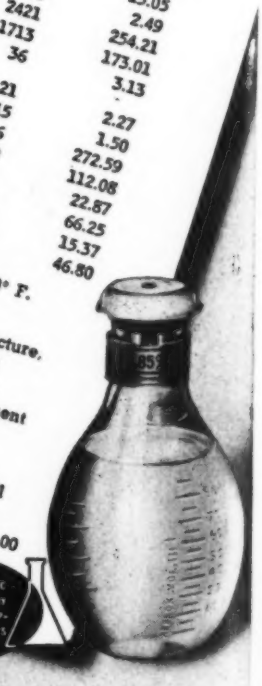
WASHING UNITS



HEADQUARTERS FOR SCIENTIFIC GLASS BLOWING, LABORATORY AND CLINICAL RESEARCH APPARATUS, REAGENT CHEMICALS

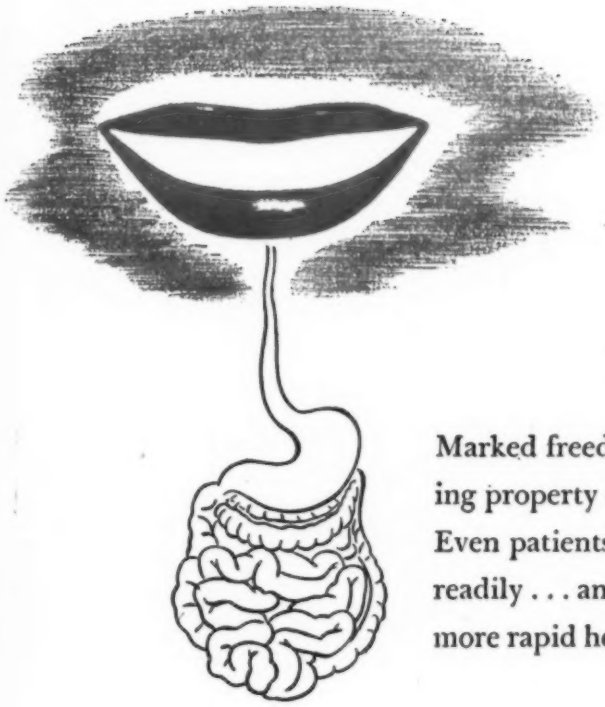
ORDER TODAY *or write us immediately for further details*

MACALASTER BICKNELL COMPANY

243 Broadway **Cambridge 39, Massachusetts**

Fenwal

THE SOLUTION DESIRED AT THE INSTANT REQUIRED



Agreeable Iron...

Marked freedom from gastro-intestinal distress is an outstanding property of Fergon—Stearns' stabilized ferrous gluconate. Even patients intolerant to other forms of iron accept Fergon readily . . . and most patients show more efficient utilization . . . more rapid hemoglobin gain.

Fergon

STEARNS FERROUS GLUCONATE

For Hypochromic Anemias

THERAPEUTIC APPRAISAL: *Better Tolerated*—Fergon is only slightly ionized, therefore virtually non-irritating even when administered before meals. *Better Absorbed*—Fergon is soluble throughout the entire pH range of the gastro-intestinal tract. *Better Utilized*—as shown by comparative clinical studies.*

INDICATED in the treatment and prevention of hypochromic anemias, especially in patients intolerant to other forms of iron.

AVERAGE DOSE for adults is 3 to 6 tablets (5 gr.) or 4 to 8 teaspoonfuls of elixir daily; for children, 1 to 4 tablets (2½ gr.) or 1 to 4 teaspoonfuls of elixir daily.

SUPPLIED as 5% elixir, bottles of 6 and 16 fl. oz.; 2½ gr. tablets, bottles of 100; 5 gr. tablets, bottles of 100, 500 and 1000.

A trial supply will gladly be sent on request.

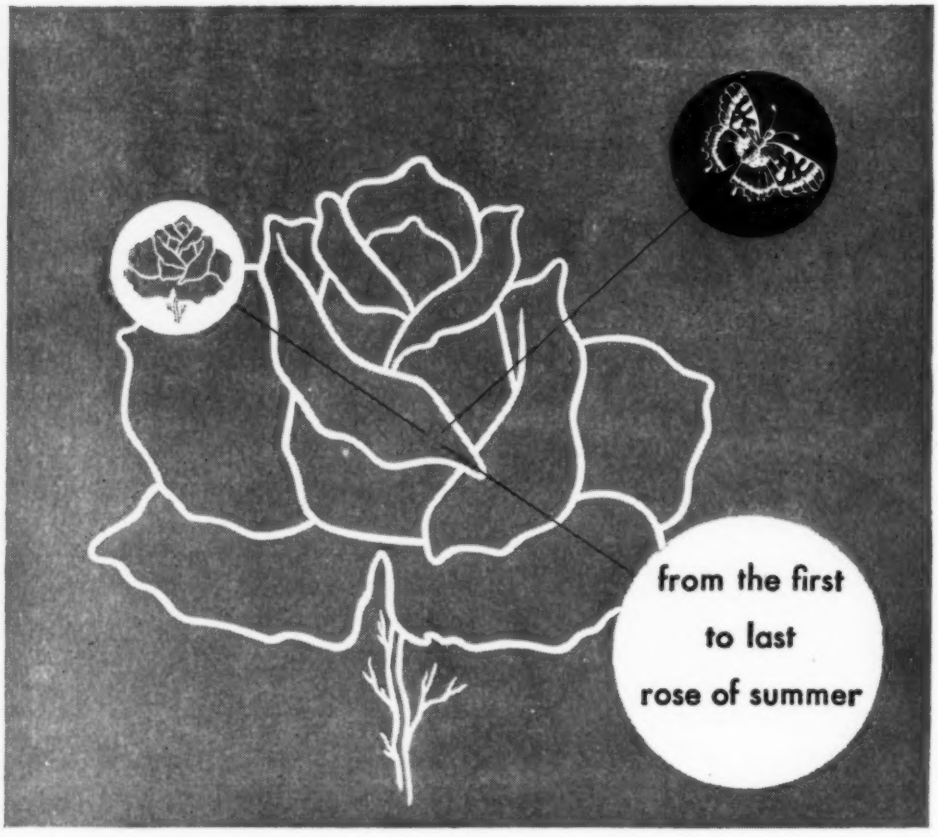
Frederick Stearns & Company
Division

DETROIT 31, MICHIGAN

NEW YORK KANSAS CITY SAN FRANCISCO WINDSOR, ONTARIO SYDNEY, AUSTRALIA AUCKLAND, NEW ZEALAND

*Reznikoff, P., and Goebel, W. F.; J. Clin. Investigation 16:547, 1937

Trade-Mark *Fergon* Reg. U. S. Pat. Off.



. . . many of your patients will be harassed by a variety of pruritic skin irritations which require prompt, symptomatic treatment.

Your patients with ivy and oak poisoning, summer prurigo, insect bites and other dermatoses commonly encountered during the summer season will welcome the prompt, soothing relief provided by 'Caligesic' Analgesic Calamine Ointment.

A greaseless, bland cream with anesthetic, analgesic, astringent and protective properties, 'Caligesic' Ointment does not stain the skin and may be used safely on infants. It is also useful in the symptomatic treatment of such conditions as intertrigo, pruritus ani, pruritus vulvae and pruritus scroti.

Each 100 Gm. contains: Calamine, 8.00 Gm.; Benzocaine, 3.00 Gm.; Hexylated Metacresol, 0.05 Gm. Supplied in 1½ ounce tubes. Sharp & Dohme, Philadelphia 1, Penna.

'CALIGESIC' *ointment* | Analgesic Calamine Ointment (Greaseless)

SHARP & DOHME

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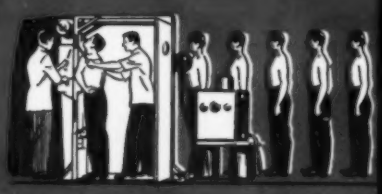
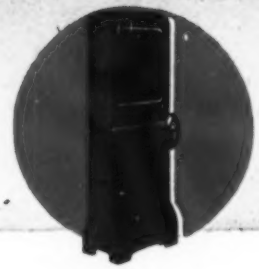
As Part of a Complete X-Ray Service



CASE-FINDING TEAMS

USING mobile, modern equipment, *Powers Case-Finding Teams* operate anywhere in the country. The equipment, employed by trained technicians, is set up at a convenient spot within the sponsor's building. It uses regular 220 volt, A.C. power, and provides full size 14" x 17" radiographs. This convenient method permits group case-finding operations with a minimum of trouble and loss of time, and at unusually low cost. Other features of the complete Powers X-Ray Service are:



POWERS MAGAZINE CASSETTE, loaded in the same manner as an ordinary camera with Powers X-Ray Paper. As many as 50 radiographs can be made without reloading or changing cassette The cost is small since the equipment is loaned by the company.

POWERS X-RAY PAPER, in standard cut sheet sizes, provides economical x-rays of high diagnostic quality. More than 4,500,000 chest radiographs have been made on Powers X-Ray Paper in the past 13 years.

For full details on the complete Powers X-Ray Service, or any one feature of it, write to

Over half a million chest x-rays taken last year on Powers X-Ray Paper

POWERS X-RAY PRODUCTS

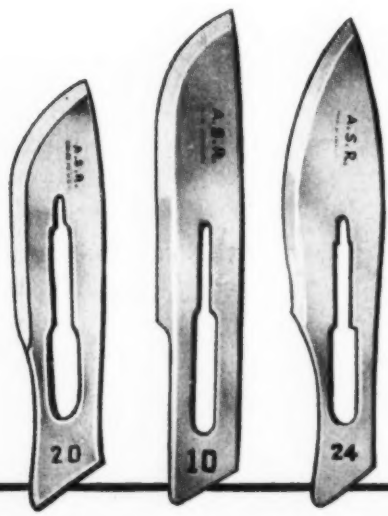
POWERS X-RAY PRODUCTS, Inc.

Glen Cove, L. I., N. Y.

Group Radiography

THE EDGE OF EXPERIENCE

ONE generation teaches another . . . Today's master-surgeon passes on to younger hands his growing legacy of learning. In much the same way, his trusted A. S. R. Blade stems from a proud tradition of professional skill and experience — that of the master-craftsmen whom A. S. R. has trained as lifelong blade-making *specialists.* Men who themselves are heirs to a unique and cherished trust: *our more than fifty years of doing one thing well . . . creating precision edges worthy of the fullest confidence.*



Exacting surgeons specify A. S. R. Blades for important reasons: their correct degree of keenness, assured "feel" and perfect balance. Under every surgical test, "a tool you can trust."

Available in 9 sizes to fit all Standard Surgical Handles.

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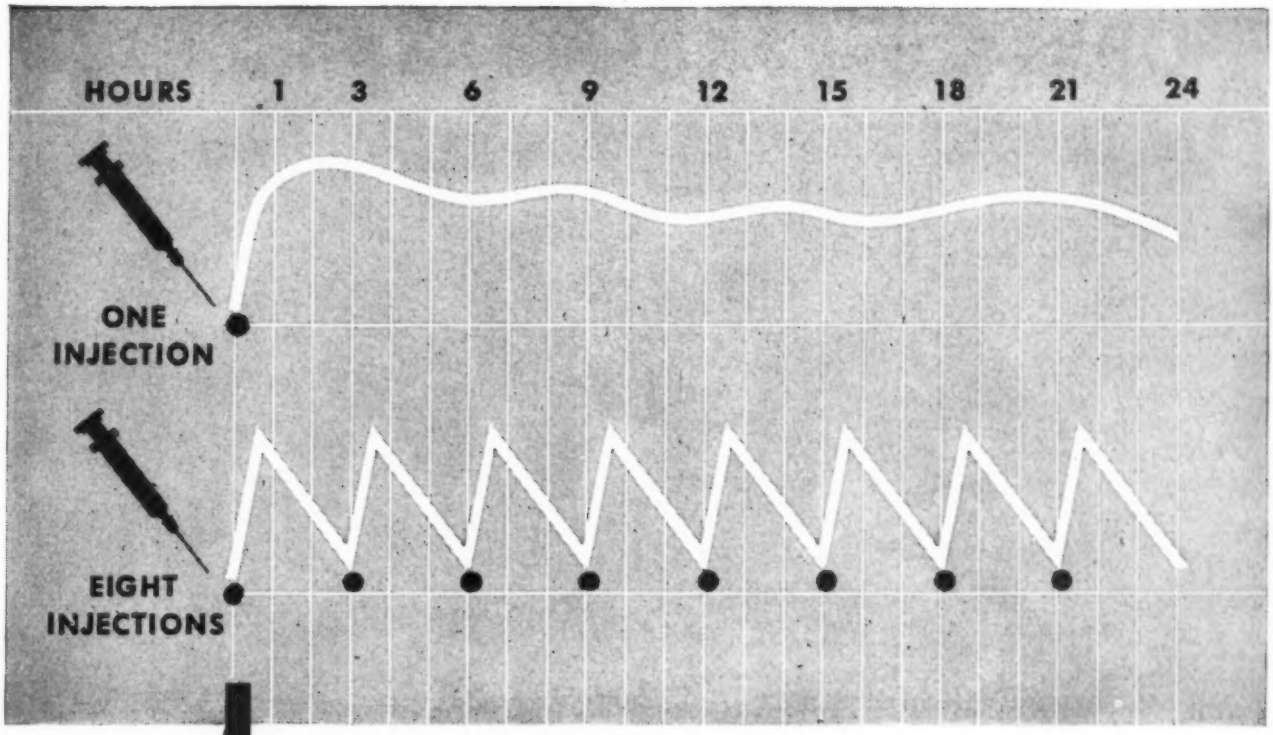
Surgeon's Blades and Handles

SURGICAL DIVISION, AMERICAN SAFETY RAZOR CORPORATION, BROOKLYN 1, NEW YORK

Makers of fine edges for over half a century



MAINTAIN HIGH PENICILLIN TIDE IN THE BLOOD STREAM BY ONE INJECTION IN 24 HOURS WITH TRUE ROMANSKY FORMULA . . . OFFERED BY BRISTOL LABORATORIES

Office or home treatment now becomes practicable through administration of Penicillin in Oil and Wax as developed by Captain M. J. Romansky (M.C.) at the Walter Reed General Hospital, Washington, D. C. With this preparation it is possible to hold a penicillin therapeutic blood level by one injection in 24 hours, thus replacing the previous use of 8 injections of penicillin in saline over 24 hours.

There is usually less discomfort to the patient, and hence better cooperation. Also, by eliminating repeated injections the cost of treatment to the patient is lowered, and there is an appreciable saving in physicians' and nurses' time. Only with the true Romansky formula, based on a single injection of 1 cc. of 300,000 units in the oil-beeswax medium, is this possible.

Bristol Laboratories now offer the true Romansky formula with calcium penicillin. Due to special processing, the Bristol preparation is especially easy to inject. Write for new literature.

BRISTOL LABORATORIES INCORPORATED

Formerly Cheplin Laboratories Inc.

SYRACUSE 1, NEW YORK

Casts Weaker in Summer?

Ever noticed that summer casts are often weaker than those you make in winter—they dry more slowly, and occasionally have so little strength they must be replaced?

Curity Research Laboratories for the first time present the explanation. Final cast strength is a function of the rate of drying. Hence, high humidity prevailing in summer retards drying. Unless rapidly dehydrated, there is a slow, weakening change in the cast's crystalline structure; small crystals dissolve in persisting water and recrystallize in large groups with weak linkages.

Identical three-inch cylinders made from 4" x 5 yd. plaster bandages were dried under

STRENGTH OF CAST IN POUNDS AFTER APPLICATION

HOURS	AVERAGE 78° F. 50% Humidity	WINTER EXTREME 100° F. 0% Humidity	SUMMER EXTREME 90° F. 100% Humidity
¼	50	50	50
10	65	140	50
20	100	290	50
30	200	305	50
40	265	305	50

varying atmospheric conditions which might exist in the hospital. Initial setting strengths were identical, but casts which dried faster had tremendously greater final strength.

Better Bandages Through Research

The New Ostic Plaster Bandages and Splints are scientifically designed to dry faster. Ostic Plaster, therefore, makes stronger casts in JUNE or JANUARY.

Features of Ostic Plaster Bandages

Faster drying casts *Quicker cast application*
Stronger casts *Lower cast costs*
Fewer bandages per cast

For better patient care and economy, Curity Ostic Plaster Bandages and Splints are unexcelled. Curity Deodorizing Bandages (Ostic type), used in conjunction, will solve offensive odor problems associated with drainage cases, such as in the Orr treatment of infected compound fractures, osteomyelitis, etc.

Let the performance of these Curity products convince you.

Curity
REG. U.S. PAT. OFF.

Products of
BAUER & BLACK
Division of The Kendall Company, Chicago 16

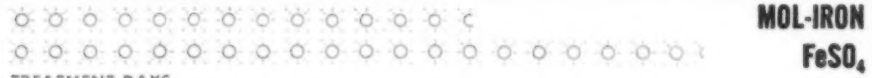
RESEARCH TO IMPROVE TECHNIC...TO REDUCE COST

Greater Response in IRON-DEFICIENCY ANEMIAS

White's MOL-IRON TABLETS

White's Mol-Iron is a specially processed co-precipitated complex of molybdenum oxide 3 mg. (1/20 gr.) and ferrous sulfate 195 mg. (3 gr.). Available clinical evidence indicates that it is not only tolerated much more satisfactorily than ferrous sulfate, but also that its use provides the striking advantages charted below:

GREATER RAPIDITY OF CLINICAL RESPONSE



Completely effective therapeutic response (return to normal blood values) was obtained in an average of 13.7 days of Mol-Iron therapy—whereas ferrous sulfate therapy *failed* to produce normal hemoglobin values even after an average of 20.3 days.

GREATER AVERAGE DAILY HEMOGLOBIN INCREASE

Note that the group treated with Mol-Iron averaged a daily hemoglobin increase markedly greater than the increase achieved with ferrous sulfate.

MUCH LOWER AVERAGE INTAKE OF IRON

The group treated with ferrous sulfate ingested 100% more bivalent iron than the Mol-Iron treated group—yet in the Mol-Iron group a return to normal blood values was achieved whereas optimal response in the ferrous sulfate treated group was not accomplished in the period of study.

WHITE LABORATORIES, INC.
Pharmaceutical Manufacturers
NEWARK 7, N. J.

Charts summarize results of controlled study of comparative therapeutic response in post-hemorrhagic and nutritional hypochromic anemias. Series includes 49 cases treated with Mol-Iron, 21 with exsiccated ferrous sulfate; results are typical of those observed in treatment of iron-deficiency anemias with White's Mol-Iron.

DOSAGE: 1 or 2 tablets 3 times daily after meals.

Bottles of 100 and 1000 tablets.

Ethically promoted—not advertised to the laity.

ALL THE NUTRIENTS

Essential for a Food Supplement

Whenever the intake of essential nutrients must be augmented, as in workers showing evidence of malnutrition or in those recovering from acute infectious disease, the delicious food drink which results from mixing Ovaltine with milk can be of outstanding benefit.

This palatable dietary supplement provides a wealth of essential nutrients in a pleasant, easily assimilated form. It supplies protein of high biologic value, readily metabolized carbohydrate, easily emulsified fat, essential B complex and other vitamins including ascorbic acid, and necessary minerals.

Three glassfuls daily sharply raises the intake of these nutrients, as indicated by the table of composition. Its delicious taste makes this food supplement acceptable as a mealtime beverage, and it is especially advantageous when taken with the usual home-prepared lunch. It is equally refreshing hot or cold.

THE WANDER COMPANY, 360 N. MICHIGAN AVE., CHICAGO 1, ILL.

Ovaltine

Three servings daily of Ovaltine, each made of ½ oz. of Ovaltine and 8 oz. of whole milk*, provide:

CALORIES	669	VITAMIN A	3000 I.U.
PROTEIN	32.1 Gm.	VITAMIN B_1	1.16 mg.
FAT	31.5 Gm.	RIBOFLAVIN	1.50 mg.
CARBOHYDRATE	64.8 Gm.	NIACIN	6.81 mg.
CALCIUM	1.12 Gm.	VITAMIN C	39.6 mg.
PHOSPHORUS	0.939 Gm.	VITAMIN D	417 I.U.
IRON	12.0 mg.	COPPER	0.50 mg.

***Based on average reported values for milk.**

Announcing

a New Chemotherapeutic Agent

The nitrofurans, a new class of antibacterials, are a recent discovery of Eaton Laboratories[1]. One, especially, is highly effective. This has been named *Furacin.*

Furacin is bacteriostatic and bactericidal to many *gram-positive* and *gram-negative* bacteria, and remains effective in the presence of body fluids. It is stable to heat and pH and is low in toxicity.

First Available in

FURACIN SOLUBLE DRESSING

Dissolved in a bland, water-soluble base, Furacin is first presented in Furacin Soluble Dressing, for topical treatment of wound and surface infections. This preparation liquefies at body temperature and is soluble in blood, pus and serum, which aids penetration to all parts of wounds. It is non-irritating, has a low index of sensitization and does not interfere with healing processes.

The outstanding results of clinical trials in both military[2] and civilian[3] practice indicate that it possesses important advantages in comparison with sulfonamides and penicillin used topically.

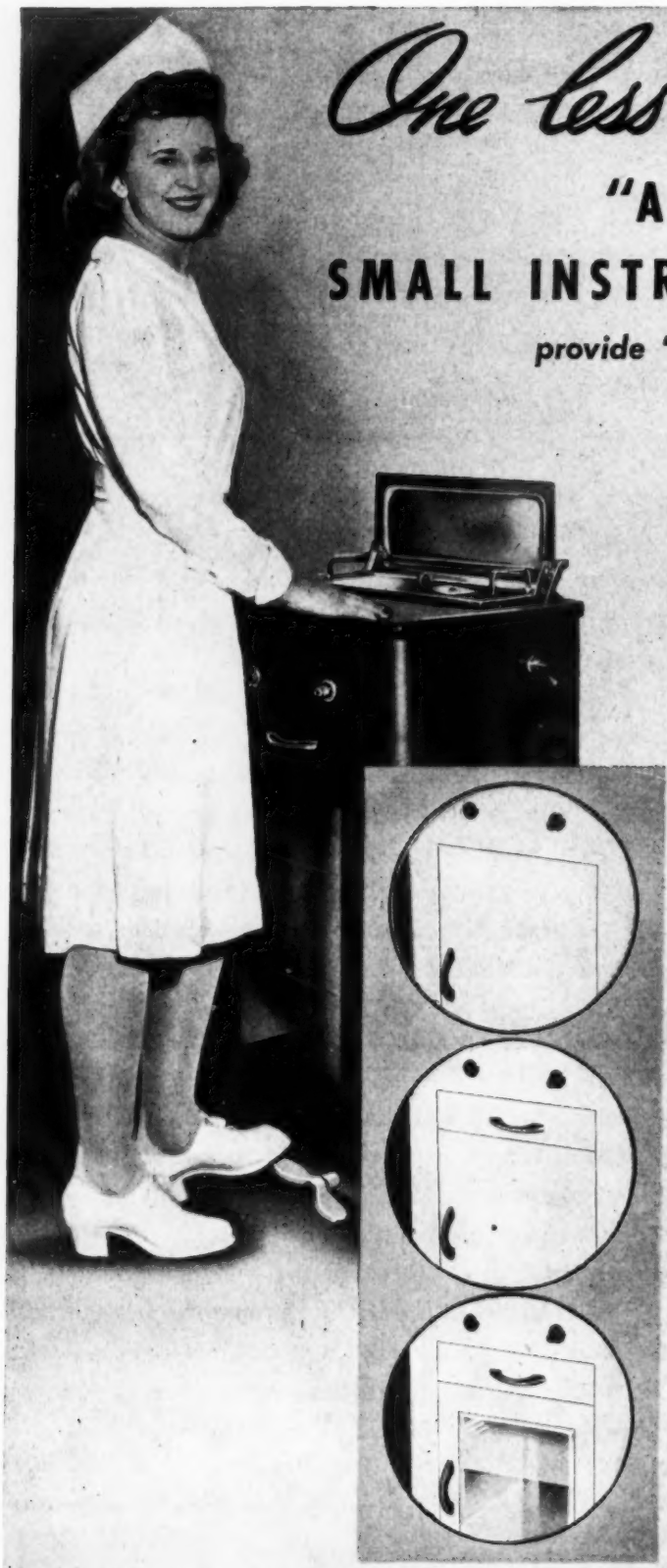
Indications

Infected surface wounds, or for the prevention of such infection—infections of third and fourth degree burns—carbuncles and abscesses after surgical intervention—infected varicose ulcers—superficial ulcers of diabetics—secondary infections of eczemas—impetigo of infants and adults—treatment of graft sites preparatory to skin grafting, and later, to prevent infection—osteomyelitis associated with compound fractures—secondary infections of dermatophytoses.

EATON LABORATORIES Inc. NORWICH NEW YORK

1. Dodd, M. C. and Stillman, W. B., J. Pharmacol. & Exper. Therap. 82:11, 1944.
2. Snyder, M. L., Kiehn, C. L., Christopherson, J. W., Military Surgeon 97:380, 1945.
3. To be published.

For literature on Furacin Soluble Dressing, write *The Medical Director, Eaton Laboratories, Inc., Norwich, N. Y.*



One less worry for me...

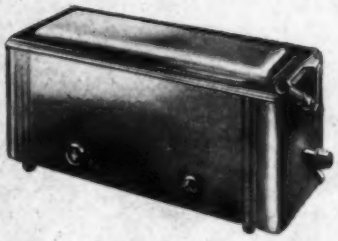
"AMERICAN"

SMALL INSTRUMENT STERILIZERS

provide "burn-out-proof" safety

To say that Doctor and I are enthusiastic about our new American Office Sterilizer is putting it mildly. The automatic control of on-and-off operation, *plus* the added greater safety of PERMANENT low-water cut-off saves me many headaches. It's my constant protection against burn-out loss of both instruments and sterilizer in case I ever forget to switch off the current before I leave . . . it shuts off automatically! Should I inadvertently leave the sterilizer in operation, I can start it again the next morning by simply replenishing the water in the chamber and turning on the current again by a flick of the switch . . . and with no damage done.

There are other features which appeal to us too. Note that the cover, which opens to a full 90° position for unobstructed removal of tray, elevates approximately 30° before lifting of tray begins. The level of the water in relation to immersed instruments can thus be easily and conveniently checked. And the completely recessed foot pedal which controls the cover lift . . . eliminates tripping annoyances and permits greater freedom of access.



NOW AVAILABLE: 14" and 16" sizes in Portable and Cabinet models. A selection of beautifully finished alternate cabinet designs subject to availability.

ORDER TODAY or write for descriptive literature

AMERICAN STERILIZER COMPANY

Erie, Pennsylvania

DESIGNERS AND MANUFACTURERS OF SURGICAL STERILIZERS, TABLES AND LIGHTS

a troublesome symptom . . .

Alumina Gel with Liquid Petrolatum 10% Wyeth

"All patients with peptic ulcer eventually develop constipation."[1] Low residue diet, inactivity and worry are responsible. But the troublesome symptom can be controlled by development of "habit time" and administration of emulsified mineral oil.

AMPHOJEL®, the standard antacid for the management of peptic ulcer, is also supplied with emulsified mineral oil as a convenient dosage form for ulcer patients with a tendency to constipation.

1. PAUL, W. D., and C. ROMBERG, J. Iowa State M.A. 35:167 (May) 1945. REG. U. S. PAT. OFF.

Bottles of 12 fl. oz.

AMPHOJEL

WITH MINERAL OIL

Wyeth

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WYETH INCORPORATED • PHILADELPHIA 3 • PA.

NEW LAMINATED PELLET

FOR

PROPHYLAXIS AND THERAPY OF MULTIPLE VITAMIN DEFICIENCY

EACH PELLET CONTAINS

8

VITAMINS

Vitamin A From fish liver oil	5000 U.S.P. units
Vitamin B_1 Thiamine Hydrochloride	2 mg.
Vitamin B_2 Riboflavin	2 mg.
Vitamin B_6 Pyridoxine Hydrochloride	0.5 mg.
Calcium Pantothenate	1 mg.
Niacinamide	20 mg.
Vitamin C Ascorbic Acid	50 mg.
Vitamin D Chemically pure synthetic vitamin D_2 (calciferol) from ergosterol	1000 U.S.P. units

PLURAVIT...

Trademark Reg. U. S. Pat. Off.

Brand of MULTIPLE VITAMINS

• • SMALL, EASY TO SWALLOW, PLEASANT TASTING PELLETS, WITHOUT AFTER-TASTE.

WINTHROP CHEMICAL COMPANY, INC.
PHARMACEUTICALS OF MERIT FOR THE PHYSICIAN
NEW YORK 13, N. Y. WINDSOR, ONT.

Otis Clapp & Son
PRODUCTS

DIMACID

DIMACID ANTACID TABLETS are prepared especially for use in reducing gastric hyperacidity. They are composed of three well-chosen, water-insoluble alkalinizing agents — magnesium carbonate, bismuth subcarbonate and calcium carbonate.

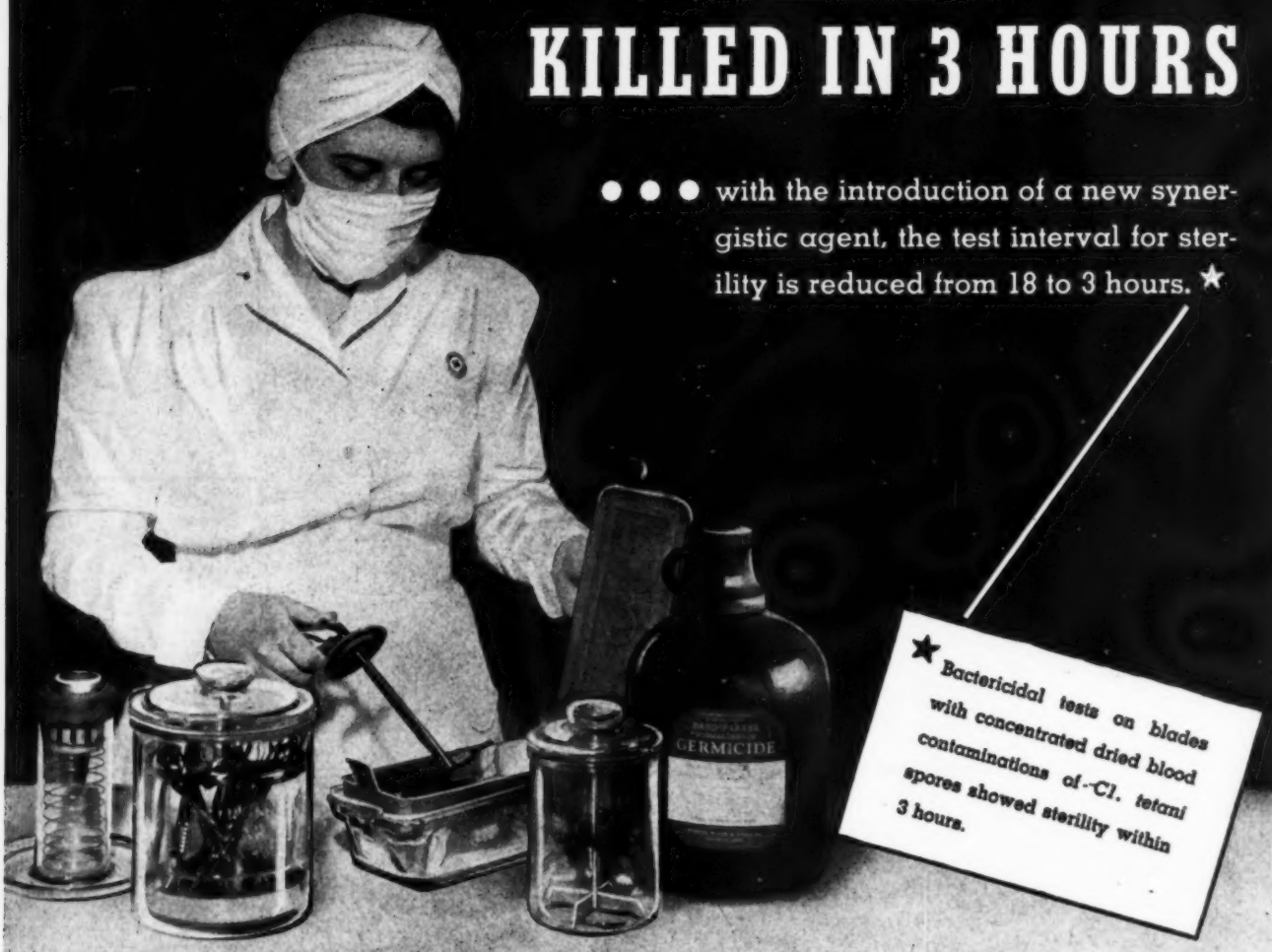
While each of these antacid materials performs a somewhat specific function, all co-operate in reducing acidity and present a most efficient and pleasant means of combating sour stomach, heartburn, nauseating eructations, etc.

Unlike the somewhat more rapid and more violent action of water-soluble alkalis, they are mild, more lasting in effectiveness, and less prone to cause over-alkalinization. They may be chewed or allowed to disintegrate on the tongue before swallowing and are found suitable and convenient in industrial use.

Otis Clapp & Son Inc.
BOSTON 16, MASSACHUSETTS

SPORES OF *Cl. tetani* KILLED IN 3 HOURS

• • • with the introduction of a new synergistic agent, the test interval for sterility is reduced from 18 to 3 hours. ★



★ Bactericidal tests on blades with concentrated dried blood contaminations of *Cl. tetani* spores showed sterility within 3 hours.

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FORMALDEHYDE GERMICIDE

in its improved form, now creates a new standard of potency for solutions employed in the chemical destruction of vetetative and spore forms of bacteria.

Of economic significance — prolonged immersion of delicate steel instruments will not result in rust or corrosive damage to keen cutting edges. Preservation of factory-new qualities constitute a major economy in annual expenditures for instrument replacement and repair.

For practical convenience — we recommend B-P Instrument Containers especially designed for use with the Solution.

Ask Your Dealer

PARKER, WHITE & HEYL, INC.
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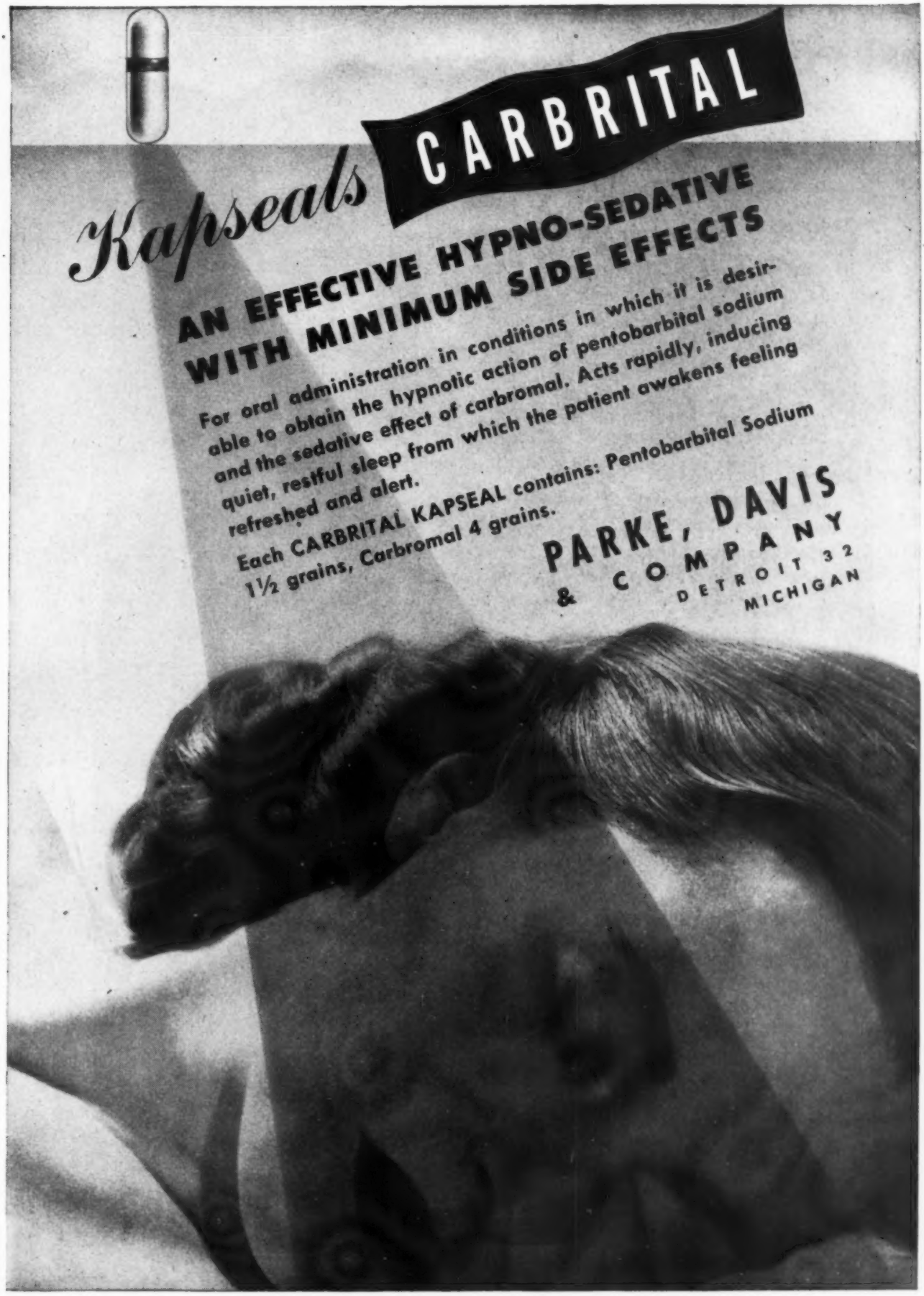
B-P
A BARD-PARKER PRODUCT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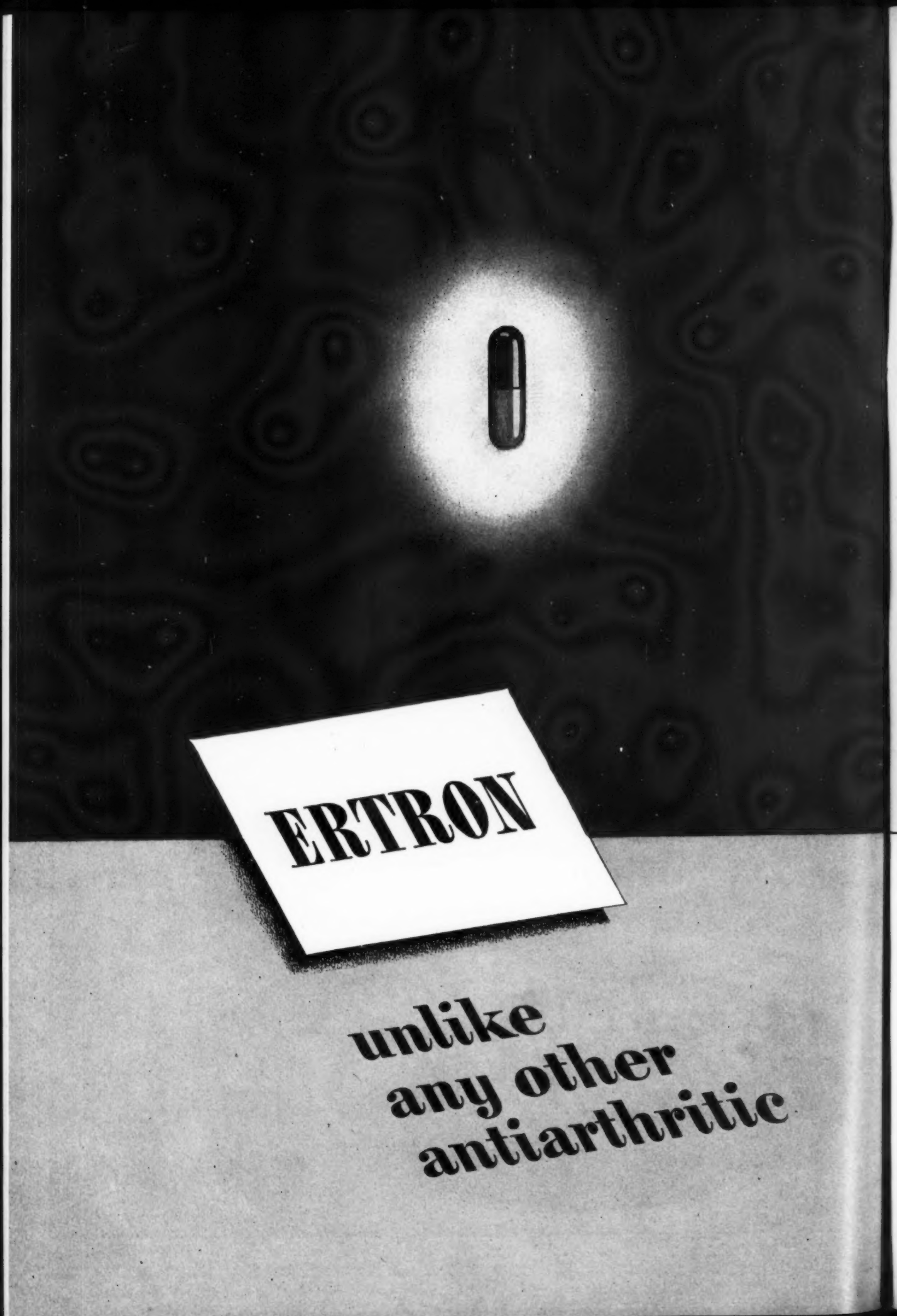
CARBRITAL
AN EFFECTIVE HYPNO-SEDATIVE
WITH MINIMUM SIDE EFFECTS
For oral administration in conditions in which it is desirable to obtain the hypnotic action of pentobarbital sodium and the sedative effect of carbromal. Acts rapidly, inducing quiet, restful sleep from which the patient awakens feeling refreshed and alert.
Each CARBRITAL KAPSEAL contains: Pentobarbital Sodium 1½ grains, Carbromal 4 grains.
PARKE, DAVIS & COMPANY
DETROIT 32
MICHIGAN


ERTRON
unlike
any other
antiarthritic

CLINICALLY EFFECTIVE

It is now known that Ertron is unique—differing clinically and chemically from all other drugs used as antiarthritic medication.

An extensive bibliography, based on ten years of clinical research, affords ample evidence regarding the effectiveness of Ertron in arthritis.

CHEMICALLY UNIQUE

It can now be stated, on the basis of recent laboratory research, that Ertron is chemically different.

Simply stated, Ertron is electrically activated vaporized ergosterol prepared by the Whittier Process. Each capsule contains 5 mg. of activation-products having a potency of not less than 50,000 U.S.P. Units of vitamin D.

Ertron contains a number of hitherto unrecognized factors which are members of the steroid group. The isolation and identification of these substances in pure chemical form further establish the chemical as well as the therapeutic uniqueness of Ertron.

ERTRONIZATION THERAPY

Physician control of the arthritic patient is essential for optimum effect. To Ertronize, employ Ertron in adequate daily dosage over a sufficiently long period to produce beneficial results. If signs of overdosage appear, discontinue medication for about ten days—then continue with three capsules per day gradually building up to the patient's level of tolerance.

Ertron is the registered trade-mark of Nutrition Research Laboratories

Ethically promoted

SUPPLIED IN BOTTLES OF 50, 100 AND 500 CAPSULES • PARENTERAL FOR SUPPLEMENTARY INTRAMUSCULAR INJECTION

NUTRITION RESEARCH LABORATORIES • CHICAGO

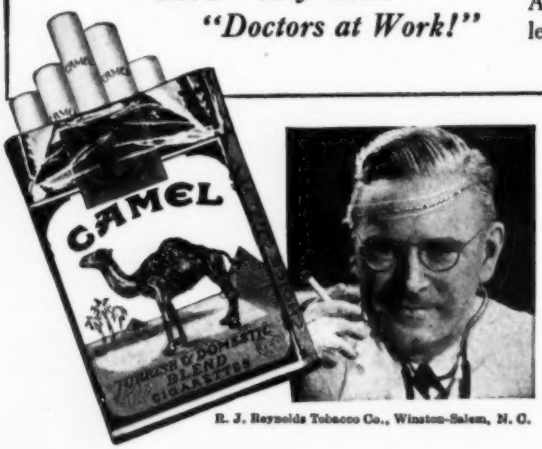
The Light that Never Fails!

"Emergency Case!"

While the city sleeps, lights blaze in a hospital ward—they mean "Doctors at Work!"

He isn't interested in making speeches and taking bows on the magnificent job he does. He's just interested in doing that job with all the skill and selfless devotion he possesses.

His battle knows no lulls. But he asks no quarter. All this he knew—and accepted—when those proud letters "M.D." were first affixed to his name.



R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

According to a recent independent nationwide survey:

MORE DOCTORS SMOKE CAMELS

than any other cigarette

White's
NEO MULTI-VI CAPSULES

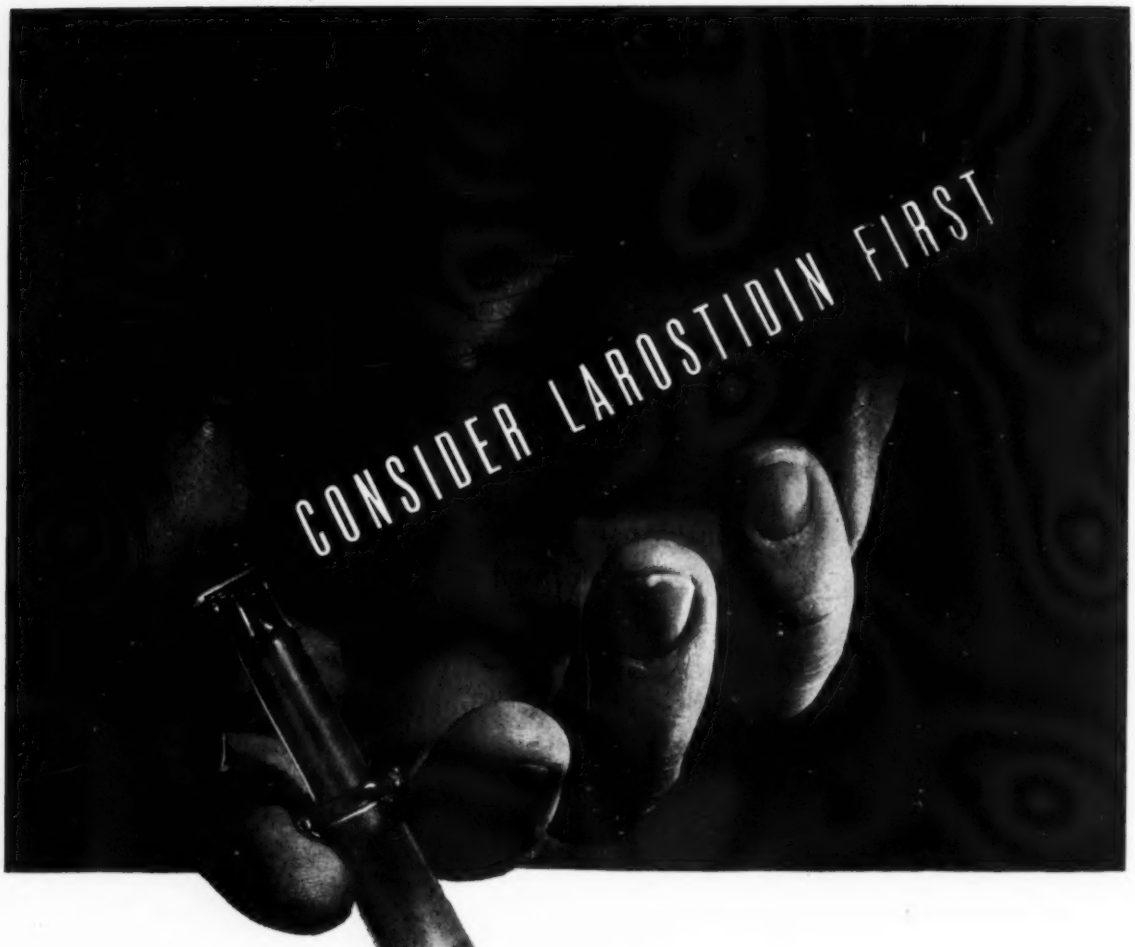
Each capsule provides nine vitamins—including all clinically established vitamins in amounts which meet or exceed adult Recommended Dietary Allowances*, yet are not wastefully in excess of the needs of the average patient for whom such multiple vitamin reinforcement is indicated. This rational formulation alone makes for economy in use—but beyond this is the fact that White's Neo Multi-Vi was purposely priced to provide maximum economy-to-patient.

Bottles of 25, 100, 500, 1000 and 5000 capsules.

Ethically promoted—not advertised to the laity.

*Food and Nutrition Board, National Research Council. "Recommended Dietary Allowances" Rev. 1945 are, of course, substantially above "Minimum Daily Requirements" promulgated by F. & D. A.

PHARMACEUTICAL MANUFACTURERS
White LABORATORIES, INC. NEWARK 7, N. J.



The efficacy of the diet-alkali management of peptic ulcer cannot be denied. But before rigid dietary restrictions and bed-rest are employed the Larostidin treatment merits your first consideration. Larostidin 'Roche' has been found equally effective by many investigators and it affords the patient a much simpler, more convenient method of obtaining rapid relief. Ulcer patients usually remain ambulatory and on the job during the entire course of 24 daily injections—and even in severe cases, marked relief of pain and other distressing symptoms often follow the first few injections. Supplied in boxes of six 5-cc ampuls... HOFFMANN-LA ROCHE, INC., NUTLEY 10, NEW JERSEY.

FOR THE AMBULATORY TREATMENT OF PEPTIC ULCER **LAROSTIDIN** 'ROCHE'

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Industrial Medicine

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The Science, the Law and the Economics of Industrial Health

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Hostile Dependent Behavior in Rehabilitation

—Of Veterans with Psychoneuroses and of the Industrially Injured with a Psychologically Protracted Convalescence—

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IN EVERY treatment involving psychiatric understanding, the therapist must be aware of the degree in which dependent impulses, or the patient's reaction against these impulses, color or motivate the presenting symptomatology. In a psychiatric treatment having as its goal the rehabilitation of the industrially injured with a psychologically protracted convalescence or veterans suffering from psychoneurosis, the problem of dependence has special importance. Not only does the psychiatrist have to give his patient the painful recognition that his behavior is the result of his own dependent impulses, but also, through this recognition, that he must give up the economic support provided by the employer or government which makes it possible for the dependence to continue. This paper describes the psychologic nature of hostile dependent behavior in the psychologically protracted convalescent, and in the veteran with a psychoneurosis, and the manner in which it interferes with rehabilitation both as to the patient, and society's attitude toward him.

At the state-operated Veterans' Rehabilitation Center in Chicago, a program for the rehabilitation of psychoneurotic veterans and veterans suffering from an ambulatory psychosis has been developed that has as its basis the understanding of human relationships of which psychologic dependence is one. In this paper suggestions will be made for the formulation of a program of treatment and rehabilitation of the industrially injured patients with psychologically protracted convalescence which incorporates the understanding and experience gained at the Center.

The existence of laws requiring the payment of compensation benefits during the period that the patient is regarded as unable to return to work adds a factor to the treatment of the psychologically protracted convalescence. On one hand, these compensation benefits tend to prolong the convalescence; and on the other hand, they produce certain attitudes on the part of those whose responsibility it is to administer these benefits which further contribute to the patient's symptomatology. The patient with clinically prominent dependent attitudes does not say to the individual upon whom he is dependent, "I am dependent; I am behaving as a child. You take care of me; you support me; you provide for my needs!" Instead he presents to the physician a behavior unique to this type of patient. His behavior is unlike that of the usual psychoneurotic patient coming to the psychiatrist for help whose dependence manifests itself in a doctor-patient relationship and whose objective is a relief from distressing symptoms. Such a patient will cooperate, will accurately report complaints, and will accept the treatment suggested. The patient with a psychologically protracted convalescence does not as a rule come to the psychiatrist for a treatment which will lead to a return to work, even though this may be his stated purpose, and the psychiatrist be one of his own choosing. He seeks, rather, a diagnosis with a bad prognosis. He vigorously opposes one which does not show relationship between his presenting symptoms and the accident. If a diagnosis is given which suits his desire to show both a bad prognosis and a correlation between symptoms and accident, he reacts warmly to the psychiatrist or physician and cooperates to a degree. The behavior of these patients strongly resembles that of the hypochondriacal and neurasthenoid patients, where the symptoms, defensively presented, are in the nature of fantasies and of body delusions, and the problem one of a character disorder. True psychosomatic symptoms in these patients are rare, and if present, such a patient should be classified as an anxiety hysteria rather than a psychologically protracted convalescent. The presenting emotions during the psychiatric consultation, which usually comes late in the course of convalescence, are those of anger, rage, argumentativeness, suspicion, frustration, feelings of being taken advantage of, rejection, and abuse. The physician who treats these patients has to determine whether or not the symptoms presented are the result of the injury, and whether they are of such a nature as to interfere with the patient's return to work. If the physician is able to determine on a purely

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medical or surgical basis that the patient is able to return to work, he then has the responsibility of disregarding the rationalizations for dependence, and for terminating the benefits which give the patient economic support. The acceptance or rejection of the patient's dependent attitudes becomes an issue in the doctor-patient relationship. In some instances, insight as to the psychologic nature of the symptomatology will cause many to give up their rationalizations and return to work. In other instances, however, patients do not respond so effectively, and hostility, frustration, and anxiety are increased, with a vicious circle of development.

Generally speaking, there is very little therapeutic interest on the part of employers, claim men or industrial physicians in this behavior. For the most part they are contemptuous, abrupt, and curt in the manner in which they dismiss the rationalizations for dependence. The patient is usually made to understand that his behavior is socially undesirable. The caustic attitude exhibited toward such a patient is not confined solely to decisions as to termination of the compensable period in the convalescence. Physicians who are alert to the psychoneurotic nature of the behavior are reluctant to admit such patients into hospitals, or if they do, they attempt to terminate the hospitalization as quickly as possible. Nurses, often with unwarranted vigor, carry out orders that serve to discourage the acting-out of dependent attitudes. Industrial surgeons with long experience strongly oppose the use of palliative orthopedic belts, braces, or casts, or of exposing the patient to any medical or surgical procedure if indications are equivocal and there is any possibility of unpleasant or partially disabling sequelae. They know how often such procedures are utilized by the patient as further rationalizations for dependence. On the other hand, inexperienced surgeons, unaware of the psychologic meaning of the eagerness with which such patients pounce upon any suggestions whatsoever for the treatment or diagnosis of the symptoms which they present for consideration, proceed in giving simple or elaborate treatment, too late finding out that all they have done is to promote a psychologically protracted convalescence with more presenting symptoms usually than the patient had when the treatment started.

The patient's occasional need for legal protection further complicates the industrial scene. His attorney, sincere in his wish to protect the patient's interest, often unwittingly furthers the development and reinforcement of the various manifestations of the hostile dependent behavior. Family, friends and labor just as unwittingly give nurture to the dependent state, each for the special investments involved.

In some states, an additional complication has been the possibility of obtaining lump sum settlements. Any psychotherapeutic approach is severely handicapped where this possibility exists. Some physicians regard the giving of the lump sum settlement as the only satisfactory means of terminating a psychologically protracted convalescence. It is not new to psychiatric experience that a patient will give up his asocial or symptomatic behavior when he is granted fulfillment of important wishes. Military psychiatrists are very familiar with the quiescence of severe presenting symptoms when patients became aware that they no longer had to engage in combat. Patients in disagreeable or intolerant adjustments in civilian life often cease to have symptoms when removed from emotionally difficult situations. However, this type of improvement does not indicate any basic change in the patient's personality, but indicates, merely, that the patient has exchanged his illness for an acceptable relief from his anxiety. However practical the lump sum settlement may be as a method of terminating dependent behavior, it is obvious that its continuation as a therapeutic and economic tool for the resolution of the problem involves flagrant abuse of the aims and ethics of medical practice and puts a premium on asocial or psychoneurotic behavior. It is palliative and not socially or therapeutically constructive in terms of a more permanent rehabilitation of the individual to society as an active, contributing force.

Claim men, who intuitively recognize that the patient is seeking a lump sum settlement in exchange for his willingness to give up his non-conformist behavior, tend to show quite overtly their scorn and angry deprecation of such individuals. Their very strong emotional reactions, aside from practical considerations and cultural attitudes, have as deeper causes a reaction against being taken advantage of, and often a need to deny not too well compensated dependent impulses in themselves by condemning any justification or reward for any overt manifestations of dependence.

A further complication to the therapy of such patients has been the rendering of legal decisions to the effect that a traumatic neurosis is a total and permanent disability. That such decisions could have been rendered is indicative of the lack of understanding of the true nature of a psychoneurosis and of the ineffectual type of psychiatry being practiced in the industrial scene.

Psychiatry must meet the challenge presented it by the injured patient with a psychologically protracted convalescence and create a method of treatment that will not utilize a purchase price as a therapeutic tool, but create, instead, a method psychologically rather than economically oriented. Before the psychiatrist can function as a therapist, the state compensation laws must be revised on the basis of recommendations proposed by a commission composed of psychiatrists, industrial surgeons, labor leaders, and insurance men focusing on the rehabilitation of men and women as personalities rather than as hostile threats to the socio-economic status quo.

While it is true that the traditional contempt for dependent individuals without overt organic causes was exhibited by some military physicians and by some civilians, the war, on the whole, seems to have crystallized public support and sympathy for psychologic explanations of human behavior. Public disapproval of the Patton incident reflected this new attitude. Veterans who have been given a psychiatric diagnosis are found to have been spared as far as possible the trauma secondary to having been thus labeled. Many of them have had excellent psychiatric care during the acute phases of their illness. The influence of psychologic orientation in recommendations for improving the morale and general efficiency of the armed forces is well known. Great emphasis was put on prophylactic, psychiatric treatment. The widespread use within the armed forces of recreation, physical education, and occupational therapy in a non-hospital environment as part of a psychiatric treatment attained a high degree of perfection. Significant in the psychiatric treatment was the development of teamwork between psychiatrists, officer personnel, chaplains, nurses, psychologists, social workers, and activity therapists. The administration of the pension laws has for the most part encouraged rather than discouraged the veteran to return to work or to seek further psychiatric treatment even though the success of the efficient administration of these laws

has been marred occasionally by the abuse of the unemployment compensation laws. The Veterans' organizations have interested themselves not in an increase of disability benefits but instead in improving and securing psychiatric treatment. The State of Illinois operates a Veterans' Rehabilitation Center for psychiatric treatment of veterans in Chicago where the responsibility of the psychiatrist is solely to the veteran. This Center represents the development of new trends in the psychiatric treatment of psychoneuroses where there are complicating socio-economic factors.

The question may be raised as to whether this new found tolerance toward the psychoneurotic veteran is a permanent trend in public attitudes. Was it motivated largely by the need for expediency in the armed forces and guilty feelings of those who stayed at home? Or is it something more secure, more in the nature of a growing awareness that human relationships need more than a surface understanding? There are strong indications to be found in the creative arts, in the theater, and on the lecture platform that the public is approaching a new era in psychiatric insight.

WE HAVE given some attention to the industrial and military scene, but before the underlying, deeper psychologic problems involved can be understood, we must consider the overt behavior presented by the patient. This understanding involves a recognition that the character of the dependent behavior differs with the type of personality, and that because of differences present, a classification is possible. Such a classification does not include that large group of dependent psychotic individuals whose degree of dependence or reaction against their dependence is so severe that institutionalization under isolation procedures is necessary. This type of patient is rarely seen in industrial practice but is frequently seen in military practice. Neither does this classification include the psychopathic personalities who are usually classified by industrial and military surgeons as malingerers or those without aptitude for a given occupation; nor does it include the majority, by far, of the psychoneuroses where the dependent behavior is but a minor feature and does not interfere with continuation of one's occupation. It includes only those individuals who do not return to work, and whose behavior contains demands for support and recognition of the dependent state.

The classifications are as follows:

Group I—Those whose characters are of such a nature that when they have had an opportunity to experience for medical reasons a period of hospital care, attention, and emotional support, they are reluctant to give up the dependent state. They are individuals who have "tasted blood" and feel the call of the Shangri-la of the past. They may be individuals who did not receive the amount of hospital care they felt was indicated, and deprived of this, still seek gratification of the awakened dependent impulses. They usually vigorously seek dependence through one rationalization or another, refusing to recognize their complaints as rationalizations; instead, they protest very loudly their wish to return to work or give other evidence of independent wishes. They say they would act in an independent manner if it were not for the existence of symptoms. Should their rationalizations be denied or not regarded with what they believe appropriate respect, they seek more convincing means of gaining their end and become very skillful and consistent in their manifestation of dependent behavior. Continued frustration of their gratification produces hostile attitudes.

Group II—Closely allied to the behavior of those in Group I is the behavior of those who are involved in severe collateral emotional problems at the time of their injury. The neurotic solution of their problem is the development of a dependent state. This solution they cannot face, so like those in Group I, they try to find a socially acceptable rationalization.

Group III—Those in whose character development a hypersensitivity to rejection occurred early in childhood. During convalescence, so long as they feel wanted and accepted, they will exhibit cooperative and socially acceptable behavior; but if they begin to feel rejected, the threshold to this feeling being very low, they react with panic and hostility.

Group IV—Those who have the type of character development which causes them to regard their injury not as if it had been caused by an accident or the fortunes of war, but instead by their employer or their government. They are the individuals who since childhood have had fear of and anger against authoritative individuals. These may belligerently refuse to go to work. It is as if they were saying, "You have injured me. You made me weak. Now it is your responsibility to take care of me, or make good the harm you have caused me." Prominent in their symptomatology is the statement, "I am too tired to go to work. I am tired all the time. I get tired very easily." They exhibit the most intensely hostile attitudes of all the groups.

Group V—Those whose character development requires a conscious denial of passive dependent attitudes and to whom a dependent state means weakness, something unmanly. During the period of their actual disability they are noted to be hypersensitive to being taken advantage of, to not being cared for properly, to being outwitted. Their defense against these feelings increases as they get the feeling they are being pushed around. They approach with hostility and suspicion those they believe are trying to overwhelm or coerce them. They will be more bitter, more critical, more clever than the others. The continuation of the dependent attitude involves both a gratification of passive dependent attitudes, and angry defenses against them. They are psychologically unable to accept any recognition of their passive dependent state as such. They vigorously seek recognition of their rationalizations for refusing to return to work. These individuals believe they must have the last word, must win out at all cost.

Group VI—Those whose character development has created a tendency to be a martyr, and to accept sacrifices. These individuals react to a dependent state, its vicissitudes and renunciations, with a provocative behavior which invites further suffering. A vicious circle is set up in which the defensive hostility acts as a provocative agent. This type of individual sometimes gets involved in one of the unfortunate complications related to compensation. As a plaintiff he may be awarded a total and complete disability by an arbitration board. Respondent's attorney may decide that rather than gratify wishes for a lump sum settlement, he will pay out the claim in small depriving weekly benefits. Such a patient will accept this economic sacrifice for an indefinite period of time because it offers him the psychologic gratification of being pushed around, of being made the sufferer.

For purposes of simplicity of description, psychologic reactions of these patients have been presented in groups. It is usual clinical experience that a given patient will show two or more group characteristics. Of importance is the fact that the hostility which is revealed may be the hostility of frustration, the hostility of displacement, the hostility of rejection anger,

the hostility of revenge, hostile defense against being taken advantage of, or provocative hostility inviting attack. There still remains another type of hostility, that which is related to the reaction of the patient to his own feeling of not "holding his end up." In our culture man is expected to work, to shoulder the responsibilities of home and society. From childhood on he is aware that for work, for initiative, for striving towards independence, there is praise, admiration and material reward; that for dependence there is admonition, scorn, condemnation, and ridicule. A patient who does not work and who has no outward disabilities to substantiate his feeling that he cannot work, has a feeling of self-condemnation which arises from inherited and developed cultural attitudes. These individuals, because they were made particularly aware of our cultural attitudes toward work and the assumption of responsibility in childhood, are so hypersensitive to the fact that they are not working that they believe others condemn them as they condemn themselves. This phenomena, called a "projection," often presents itself as a great source of anxiety, and must be dealt with before any of the underlying problems can be treated. The tendency to project one's feeling of condemnation usually manifests itself in an intensification of the need to have rationalizations for not working accepted, in an angry denunciation of those toward whom he projects his feelings, in ideas of reference, or in hostile depressive reactions. Very rarely, when a patient who has been exhibiting conversion hysterical symptoms is induced to give up these rationalizations, he develops paranoid ideas toward those who he believes think about him as he thinks about himself. He has no need to point an accusing finger so long as he feels he has justified his dependent wishes with socially acceptable hysterical symptoms.

At the state-operated Veterans' Rehabilitation Center, we have developed a philosophy of treatment which we believe is particularly suited for the rehabilitation of those veterans with anxieties, depressions and projections related to hostile dependent attitudes. The treatment has three divisions: (1) The creation of a tone or atmosphere at the Center and its utilization as an integral part of the total treatment; (2) a program of activity therapy prescribed by the psychiatrist to meet the patient's individual personality needs; (3) psychodynamically oriented psychotherapy given on an individual group basis.

The atmosphere or tone of the Center is that of a men's club rather than that of a hospital. Some patients reside at home while taking the all-day therapy, others reside at the Center. The average length of time the patients reside at the Center is one month. They then live at home and return for the all-day therapy. The knowledge of this fact enables newcomers to recognize that their stay at the Center is voluntary, that their liberties are not restricted. The patient soon becomes aware also that he is understood and accepted. He becomes conscious that activities are being utilized not to entertain him, or to keep him busy, but to develop in him those character traits, the lack of which, or the inadequate development of which, led to his insecurity. He senses the enthusiastic cooperation and good rapport of the veterans to the members of the staff. He senses a desire among the veterans to help one another, and to take pride in each other's success. Shortly after his admission, he perceives that he is part of a group wherein a tradition has already been established, and that an understanding of human relationships is regarded as basic in the treatment. He begins to realize that most of those who have been there longer than he are aware of a clinical improvement and a more mature outlook on life. He reads in the Center's newspaper, put out by the veterans themselves, of the successful occupational and training program adjustments of alumni.

The activity therapy consists of a recreational therapy department, an occupational therapy department, and a physical education department, each conducted under the leadership of specialists. All activities are prescribed on the basis of a psychodynamic orientation to the patient's personality problems. It has been determined that it is possible to prescribe activities for the encouragement or participation in group activity composed of men, or men and women, for the development of qualities of leadership and the acceptance of responsibility, for the cultivation of ease in the utilization of talents in an exhibitionistic role, and for training in working for the good of a group rather than one's own aggrandizement. In the physical education department it has been possible to prescribe activities which provide for participation in rough and aggressive play, for competition, for the development of sportsmanship and skills and body confidence, and for improving general health and hygiene. In the craft department it has been possible to prescribe crafts which improve work habits, develop skills, develop an ability to complete a task, and which arouse pride in achievement. In the arts department the veteran is given an outlet for his creative impulses and his imagination.

The psychiatrist administers psychotherapy with both direct and indirect techniques. Direct techniques include individual psychiatric interviews or group psychotherapy sessions. These are analytically oriented, when indicated. Analytically oriented group psychotherapy is alternated with sessions of dramatized psychodynamics. The indirect techniques include the prescription of activities for each patient based on a psychiatric examination and the analysis of tensions and frustrations that occur due to the carrying out of these prescriptions and the integration of the work between the activity specialists, the psychiatric nurses, and psychologists, and the social workers. As in any analytic psychotherapy, diagnosis and therapy go hand in hand.

IN THIS paper we are concerned only with treatment developed at the Center as it is used to rehabilitate those with hostile dependent behavior or other defenses against their dependence. In so much as we only accept for admission patients whose psychoneurosis or mild psychosis does not permit them to work, the presence of dependent features requiring consideration is frequent. Patients able to continue work are given psychiatric interviews in the night clinic.

It has been our experience that patients who have been treated at the Center with strong reactions against dependence go through three stages of alteration in their behavior before returning to work. In the first stage, upon admission, they may show a restless desire to leave, giving the rationalization that they must return to work and accept responsibility. They know they can leave of their own volition, yet they need the permissivity of the psychiatrist to enable them to stay and accept the offered dependence. For less severe cases, in this first stage, there is an immediate alleviation of anxiety and depressed feelings due to the initial gratification of dependent impulses. In the second stage, the deep analytic psychotherapy stage, tensions which arise out of participation in the various activities, out of the contacts with the other veterans and the staff, and out of visits with family and friends are noted and analyzed. On the basis of

psychologic orientation gained, further activities are prescribed. Often a patient will act out his emotional reactions as he does in civilian life. This acting out behavior has diagnostic value, and also offers a basis for additional interpretation. During this second stage, a careful analysis of the character of the patient will reveal special problems. One of the most frequent of these special problems is the problem of the veteran who represses his hostility due to the fact that his character does not permit him to show this emotion. Only rarely have I seen repression of aggressions in industrially injured psychologically protracted convalescents. Individuals with this character formation usually do not get as far as the psychiatrist's office. The tendency to repress their hostility because of guilt and fear causes them to accept early settlements or go back to work when they are confronted with society's rejection of hostile behavior. At the Veterans' Rehabilitation Center veterans who show such repression of their hostility are treated by progressively exposing them to activities which bring out their aggressions. As these aggressions are exhibited, the tension associated with the repressing force is analyzed. At the end of the second stage they are able to show their aggressions or hostility with much less tension or guilt. They are then ready for discharge. In the third stage, patients begin to get a recurrence of symptoms and show hostility toward the staff when they are told they must prepare to leave the Center and return to work. They regard a discharge as a rejection, or a premature move towards being put on their own two feet. These hostility and rejection feelings are repeatedly analyzed, and after this final interpretative phase of the treatment the patient is able to return to work. It is important to note that without the analysis of the hostility at this time the treatment cannot be completed. In some instances, it is necessary to have the veteran return for group psychotherapy on an outpatient basis even after he has returned to work. This procedure permits a more gradual weaning, and at the same time produces desirable character changes through additional recognitions gained.

During his entire stay at the Center, the veteran is made conscious of the goal of the treatment, that of rehabilitation in terms of personality change and work adjustment. Work is first presented to him as play, later as art, and finally as socially desirable enterprise. Final work adjustment is based on an integrated recommendation formulated by the psychologist, social worker and the psychiatrist.

Veterans at the Center show a much healthier attitude toward an activity program than do the industrially injured with a psychologically protracted convalescence. Fifteen years of experience with a psychologically oriented recreational and physical education program of treatment for the industrially injured patients has indicated that the large majority of such patients are allergic to any activity that would presume they are able to work. Frequently, when they do cooperate, they will participate in the activity program only when not under the observation of the psychiatrist. This behavior is related to their conflictual wish to deny their dependence reinforced by the medicolegal factors involved.

The program at the Center does not benefit all veterans in the same way. Some gain most through temporary gratification of their dependent wishes coordinated with an opportunity to regain their self-prestige through work and play. Some get the greatest gain by the relief from tension attendant upon being given insight into the psychologic nature of their problem, and the tolerant, understanding attitude of the Center towards this problem. Some gain largely through an analysis of their problems in human relationships which are developed at the Center. Some gain progressively as their activities are directed into heretofore forbidden channels. For some the maximum gain is in the influence of the group on their actions and reactions.

It is believed that the psychotherapeutic lessons learned at the Center offer an answer to the parallel problem in industry presented by the injured workmen with a psychologically protracted convalescence. However, before psychiatry can make use of these new psychologic techniques in rehabilitation, state compensation laws must be investigated by a commission composed of psychiatrists, industrial physicians and surgeons, labor leaders and insurance men so that revision can be made to utilize the psychiatrist as a therapist rather than a medicolegal diagnostician.

Ocular Effects of Radiant Energy

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THAT light, under certain circumstances, could seriously damage vision was a well established truth centuries ago. The early writers in medicine described the hazards of gazing at the eclipse with the unshielded eye. It was not until the latter part of the 19th century that any coordinated studies regarding the deleterious effects of radiant energy were made. The stimulus for these investigations arose from the increased frequency of cataract occurring among glass workers. Research within England and Germany confirmed the causal relationship existing between infra-red rays and glass blowers' cataract.

Industry in its ceaseless quest for new methods now not only deliberately generates infra-red, but also utilizes rays far more potent. The modern industrial physician must therefore be prepared to protect his workers from a variety of types of radiation.

The Nature of Matter

ALL matter is made up of atoms—solar systems in miniature. Normally the atom is in an electrically neutral state. Molecules are combinations of identical or different atoms. Motion within the atom, as well as between neighboring atoms is a continuous process. When energy in the form of heat or electricity is applied to a body it is transferred to the molecules, thus increasing their movement. The increase in radiation emitted from the body is an expression of this new excitation of molecular activity. Our eyes perceive the change in the physical state of an iron bar as heat is applied. The red glow of the metal is due to the emission of radiations in the visible range. The white heat is due to the inclusion of still shorter waves in the spectrum being emitted as the temperature of the bar is increased.

The Structure of the Atom

THE precise architecture of the atom is as yet unfathomed. Our present notions of it are of a mathematical nature and therefore a mechanical model presents numerous weaknesses. First Rutherford and then Bohr forsook the realm of classical physics and developed their concept of the atom, which in

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the simpler atoms such as hydrogen is acceptable to most physicists. In the Bohr atom *the core or nucleus is occupied in part by the proton:* a particle of matter carrying a positive electric charge. Enveloping this central core are a number of concentric circles or orbits which act as pathways upon which the electron travels at high velocity. In the quiescent state, the electron's travels remain confined to the innermost circle. As energy is absorbed by the atom the electron is pushed outward into a path further removed from the nucleus. This shift may occur in an orderly fashion from orbit to orbit or the electron may be violently jolted through several paths or out of the atom entirely.

For each or any of these transfers it is a prerequisite that for every change, energy of a very specific frequency and quantity must be fed into the atom. When the atom returns to its normal state, the electron retraces its steps to the innermost circle and, in so doing, radiation of a specific frequency is emitted at each transfer. By such action a series of waves of graduated frequencies can be emitted. Radiation therefore is the expression of violent changes occurring within the atom. In some instances the alteration may be of sufficient magnitude to alter the chemical composition of the substance.

The Nature of Radiation

RADIATION is the means by which energy is transferred through space. This transfer is carried out without benefit of molecular action. As you sit by a window through which the sun's rays are streaming you notice a sense of bodily warmth, yet the glass remains cold. The infra-red radiations were transmitted by the glass upon which no change was effected but absorbed by the body when degraded into heat.

The characteristics of a wave of radiation are:

1. Wave length—the distance from the crest of one wave to the crest of the adjacent wave, or identical positions on successive waves.
2. Frequency—the number of waves that pass a fixed point per second.

THE ENERGY SPECTRUM

TYPE	LENGTH	DESCRIPTION
Electromagnetic	20 KM—1MM	Radio—Wireless telegraphy. The arc from short circuits may produce cataracts.
Infra-Red	To 0.00078 mm (7800 A U)	Generated by heated bodies. (Slabs of metal and glass.) These waves upon absorption by a body increase the molecular activity with a consequent elevation of temperature. May produce cataract.
Visible	To 0.00039 mm (3900 A U)	Waves of this length are capable of stimulating the retina. In excess they may burn the retina.
Ultra-Violet	To 0.00000005 mm (5 A U)	Emitted from very hot bodies and ionized ashes. Produce chemical changes. Affect photographic plates. "Actinic Keratitis" Sun burn.
X-rays	To 10^{-8} mm (0.1 A U)	Generated by the sudden deceleration or stoppage of electrons. Very high frequencies and with the highest (hard x-rays) very high powers of penetration. May produce cataract.
Gamma Rays	To 10^{-9} mm (0.01 A U)	Result from the nuclear disintegration of atoms. Radium, uranium and other of the heavy metals. Similar to hard x-rays.
Cosmic Rays	To 10-13 mm (0.000001 A U)	Represents the annihilation of matter (Jeans). Announcement of the birth of elements (Miliken).

Fig. 1.
Chart showing the divisions of the energy spectrum

Radiation travels at the same speed as light. And like light it undergoes reflection and refraction. In its passage radiation appears to travel by means of waves while its effect on matter suggests a corpuscular nature. Perhaps we are observing two phases of the same general action.

The Energy Spectrum

THERE are many varieties of radiation extending from the long electromagnetic waves to the very short high frequency cosmic rays. Of this large group the visible portion occupies but a small section. The unit of measure of length of these waves is the Angstrom unit, named in honor of the Swedish physicist. An Angstrom unit is 0.0000001 mm (10^{-7}) in length.

The Rate of Radiation

A "BLACK BODY" is by definition a surface which absorbs all the energy incident upon it. None is reflected. In addition, all the energy is radiated from a "black body." The rate of emission of energy from a "black body" is taken as unity. As the temperature of a "black body" is elevated there is a corresponding increase in the amount of energy liberated at every wave length but not in equal proportion. This relationship is a quantitative one and by application of the Stefan-Boltzmann law we find it varies as the fourth power of the Kelvin or absolute temperature.

$H=K\,AT^4$ where A is area and T is Kelvin temperature the value of K is 1.36×10^{-12} Cal/cm^2 /sec.

If a family of curves of "black body" radiators at different temperatures is examined we notice some similarity between them. As the temperature is increased the crest of the wave shifts toward the region of shorter waves ("Wien Law"). It is the shifting of the region of maximum intensity that produces the change in color from red to blue white as an iron bar is heated.

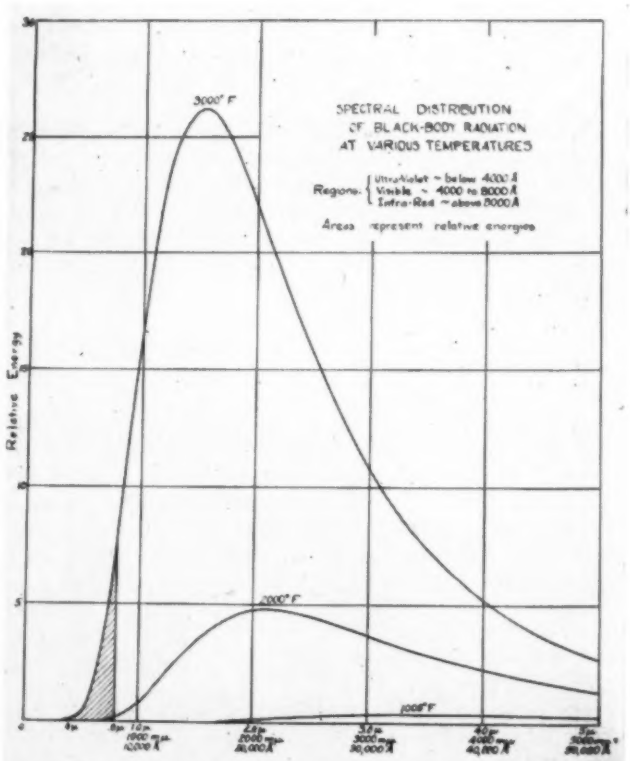

Fig. 2.
Showing the distribution of black body radiations at 1000°, 2000°, 3000° F. Notice energy in the visible range is emitted at 2000° and 3000° F

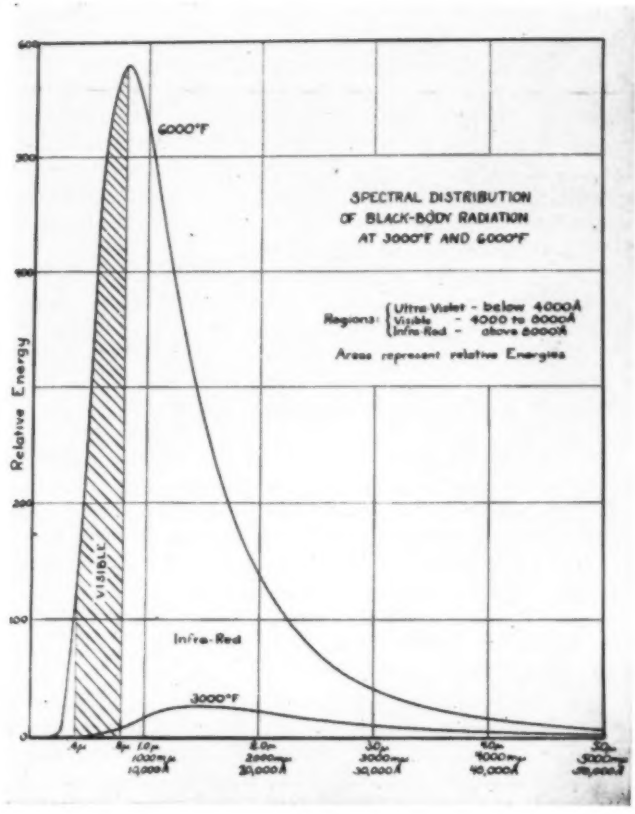

Fig. 3.
Showing energy distribution at 3000° and 6000° F. At 3000° no radiation in the ultra-violet range is present, whereas some radiations in this group are emitted with the black body at 6000° F

The Emissivity of a Surface

ONLY a "black body" emits all the energy absorbed. All other surfaces emit only a fraction of the energy incident thereon. This difference in emissivity is of importance in evaluating the potential hazards from any given surface. The emissivity of any given surface is the ratio of its radiation output compared to that of a black body of the same size and at the same temperature.

TABLE OF EMISSIVITIES
FROM "INTERNATIONAL CRITICAL TABLES"
VOL. 5, PAGE 244

Metal	392°F 200°C	752°F 400°C	1112°F 600°C
Silver	.020	.030	.038
Aluminum*	.113	.153	.192
Copper*	.568	.568	.568
Brass*	.610	.600	.589
Cast Iron	.210		
Cast Iron*	.640	.710	.777
Steel*	.790	.788	.787
Nickel*	.369	.424	.478
Monel*	.411	.439	.463
Lead*	.631		
Platinum	.060	.086	.110
Zinc*		.110	
Glass at 100°C	.88		

*Oxidized.

Fig. 5.
Table of emissivities showing the rate by which energy is emitted from different sources

Factors Modifying the Intensity Level

WE HAVE discussed not only the origin of energy but also the varieties and the rates by which these are generated. By design we have omitted the rate of generation of gamma rays. We are all well aware of recent but still secret achievements in the field of nuclear physics. In earlier years we were taught that

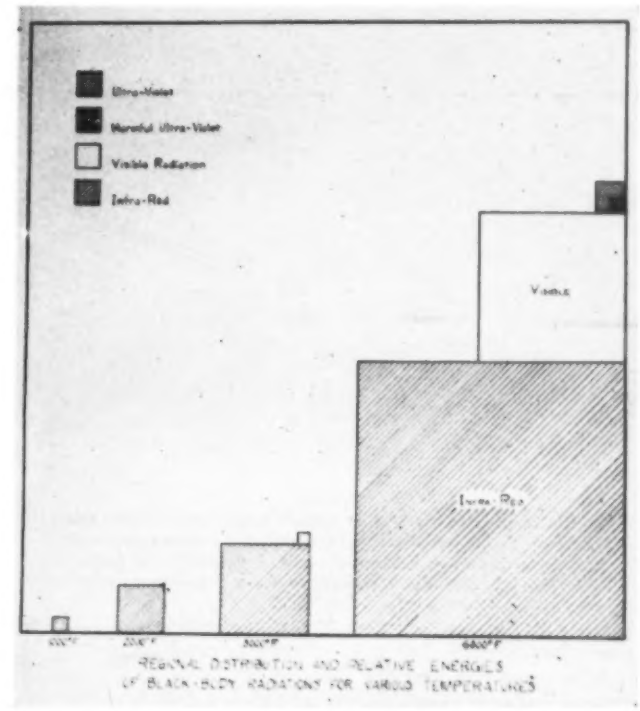

Fig. 4.
Showing the proportionate amounts of the various types of radiation at 1000°, 2000°, 3000° and 6000° F

these radiations were of a spontaneous nature and not under control of men. Our concepts now need revision.

Our next step then requires consideration of the fate suffered by these rays in their passage from their source to the eye. For the sake of convenience the word "light" will be used to include infra-red, visible and the ultra-violet ranges of the spectrum. The dust in the atmosphere in the factory absorbs much of the ultra-violet. Moisture in the air absorbs some of the infra-red.

The two major factors modifying the intensity of light incident upon the eye are:

1. *Distance from the source.* Light travels outward in straight lines from its point source of origin. If a screen of unit area be placed at increasing distances from the source a rapid and progressive loss of illumination will be observed for each new position. This rate of loss varies inversely as square of the distance from the source. A man 10 feet removed from a welder receives only 1/100 as much energy as he would if but one foot away.

2. *The angle of incidence.* The cornea being a curved surface modifies the intensity value of each ray of light incident upon it. The maximum effective energy is present only in that ray striking the cornea at a right angle to a tangent at a given point on the surface of the cornea. The line followed by this ray is called the normal. As the angle formed by the normal and the incident ray increases a corresponding loss of intensity occurs. This loss results from reflection. At an angle of 60° the incident ray has lost 50% of its effective energy. The intensity varies directly as the cosine of the angle of incidence.

The Absorption of Radiant Energy by the Eye

LIGHT in passing from one medium to another undergoes one or more of the following changes:

1. It is reflected.
2. It is absorbed.
3. It is transmitted.

In general all three changes occur in varying degree.

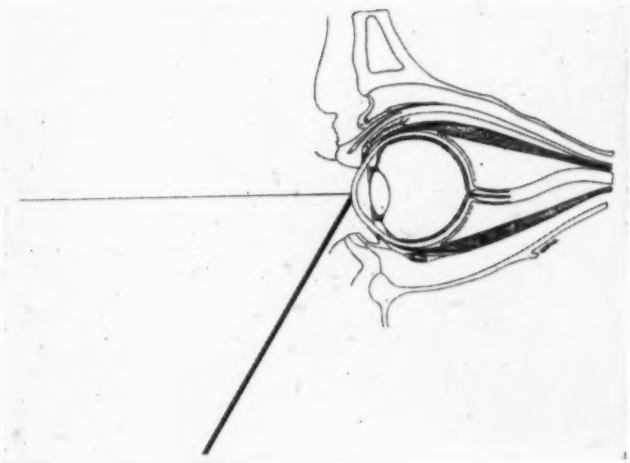

Fig. 6.
As the angle between the normal and the incident beam increases, the effective energy decreases. The cosine law states that the intensity varies directly as the cosine of the angle of incidence

To incident light, the eye presents a series of concentric layers. Each layer in its turn reacts in specific fashion according to the variety of radiation incident thereon. To radiations of certain wave length one layer may act as an impenetrable barrier while to waves only slightly different transmission is afforded. Among individuals of the same species as well as different species, some variations in transmission are to be noted. The sclerosed lens of the older workman intercepts more of the ultra-violet and infra-red. The scarred cornea likewise alters the transmission. It is of major significance that with greater intensity a pronounced increase in transmission occurs.

Absorption of Infra-Red

IN GENERAL all radiations longer than 30,000 A. U. are completely absorbed by the cornea. A slow progressive increase of corneal transmission is observed until at about 19,000 A. U. a marked increase occurs. This continues with one exception until at about 11,000 A. U. 96% of the incident energy is transmitted.

Absorption by the lens begins rather abruptly at 18,000 A. U. and continues in varying degrees until at 10,000 A. U. nearly all infra-red is transmitted. In the consideration of glass blowers' cataract that share of the etiological responsibility due to radiation must be limited to waves from 18,000 to 10,000 A. U. and perhaps the very long ultra-violet.

The iris absorbs all wave lengths of infra-red that fall upon it. Upon absorption it is translated into heat. In moderate doses the capillaries of the iris are capable of dissipating this heat. In excessive doses the surplus is conveyed to the aqueous which bathes the iris and lens with a consequent elevation of the temperature of this fluid.

By far the major portion of infra-red incident upon the cornea is absorbed by the cornea, aqueous, iris and lens. The vitreous filters out most of the remainder so that little reaches the retina. Only in very unusual circumstances does the retina suffer a thermal burn as the result of infra-red radiation.

Absorption of Visible Rays

PRACTICALLY all the visible light incident upon the eye is transmitted to the layer of rods and cones lying deep in the retina. These cells upon exposure to radiations between 7800 and 3900 A. U. initiate a series of changes terminating in vision. The surplus is absorbed by the pigmented layer and translated into heat may cause a thermal burn in excessive doses.

Absorption of Ultra-Violet

ABSORPTION of ultra-violet light by the lens begins at about 3800 A. U. and continues with increasing amounts until at 3200 A. U. and below all transmission ceases.

Interception of ultra-violet by the cornea begins at about 3200 A. U. At 2930 A. U. absorption is complete and remains so for waves of shorter length.

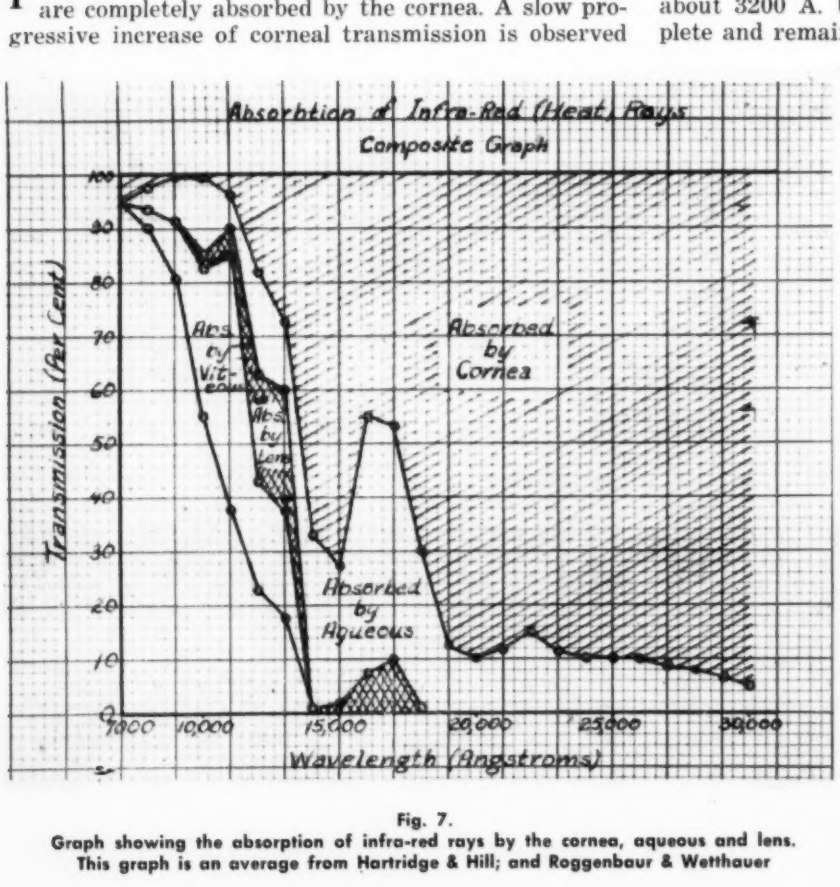

Fig. 7.
Graph showing the absorption of infra-red rays by the cornea, aqueous and lens. This graph is an average from Hartridge & Hill; and Roggenbaur & Wetthauer

The Concentration of Energy

AS NOTED previously, light in its passage through the eye undergoes many physical alterations. While some of these modifications tend to dissipate, other factors combine to concentrate the energy in its passage through the eye. The eye is made up of a series of parts, the combination of which forms an optical system. The primary purpose is to so bend light that a proper image is formed upon the retina. The net result of this refraction is the concentration of light at various depths in the eye, the site of the focal point being dependent upon the extensity and distance of the source.

The Biological Effects of Radiation

IT IS ONLY from the rays which are absorbed by the tissues that any biological effect may result (Draper's Law). The type of tissue reaction varies with the wave length of the absorbed energy. The longer waves of the infra-red group being in resonance with inter-atomic oscillations, they tend to be absorbed.

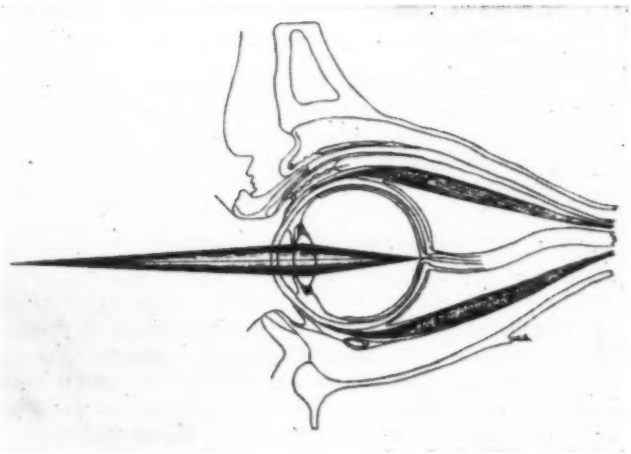

Fig. 8.
In the above diagram adapted from one contained in Duke-Elder's textbook of Ophthalmology the source of energy is small. There is a rather even distribution of energy throughout the layers of the eye. By the refractive power of the eye the light is brought to a focus upon the macula. (Macular region lies just temporal to the optic nerve.) If the incident energy is of sufficient intensity pathological changes may occur at the macula due to the concentration at the level

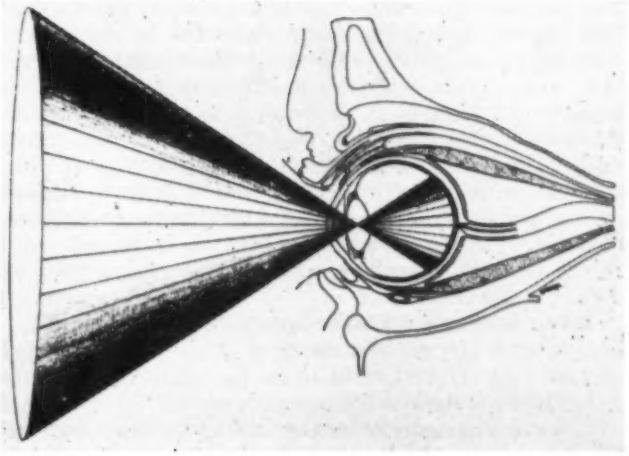

Fig. 9.
In the above diagram modified from Duke-Elder, the source is an extensive one. All the energy falling upon the pupil is concentrated within the lens and at the focal point in the posterior region of the lens enormous levels may be attained. In the retina we have a wide distribution of the energy with little or no likelihood of any serious concentration

Thereupon they incite increased activity among neighboring atoms resulting in an elevation of tissue temperature. If it is sufficiently intense, a thermal lesion results.

The shorter waves of the ultra-violet range, having the capacity of penetrating the atom, are capable of actually shaking the atom apart, producing an abiotic or destructive effect.

While the terminal effects of both infra-red and ultra-violet are identical, i.e., the destruction of tissue, the sequence of events following exposure is widely different. With the heat waves the effect is immediate, whereas, with ultra-violet, a latent period of several hours exists. With the gamma radiations, an interval of months may elapse from exposure to onset of symptoms. The lesion is primarily due to the disturbed nutrition resulting from an endarteritis initiated by these rays.

The Clinical Pathological Changes: Infra-Red

THE CORNEA: The cornea reacts promptly to exposure to excessive doses of this group. Pain is immediate and severe. The natural physiological impulse is to shut the eyes, thus clinical cases of burned corneas from this cause are exceedingly rare. When these cases present themselves the entire cornea is opaque and edematous. The anterior surface though lustreless is rather smooth. The conjunctiva promptly becomes swollen and red.

THE LENS: Following exposures from the radiations emanating from heated surfaces characteristic opacities develop within the lens and its capsule. While the term "glass blowers' cataract" is applied to this lesion, it is a misnomer. It is frequently seen among workmen in other industries where extensive surfaces of material at high temperature are encountered. Puddlers, tin plate workers and rollers frequently develop this type of cataract. The cataract develops only after long daily exposures extending over a period of years. The lesion is frequently initiated in the third decade of life and slowly matures, requiring an average of 27 years to incapacitate the worker (W. Robinson). Among older workers the incidence is higher owing to the greater absorption of the older lens to the infra-red rays. The direct physical action of these rays is augmented by the altered nutrition afforded the lens by the overheated aqueous. Goldmann and his group feel that the iris and ciliary body, by constantly being overheated, so alter the intra-ocular metabolism that cataract develops. Vogt on the other hand, feels it is primarily the physical action of the infra-red rays upon the lens that produces the lesion.

The initial site of appearance of the cataract is the axial portion of the posterior part of the lens. A somewhat flattened, well circumscribed, grayish disc occupies the posterior portion of the lens. From the center of the lens a conical shaped opacity grows forward. Vacuoles are usually seen. The most characteristic changes are seen in the anterior lens capsule. In the pupillary area the capsule splits and the curled free ends are seen to be floating in the anterior chamber. Visual impairment is noted early in heat cataract since the initial lesion is the appearance of opacities in the axial portion of the lens.

Ultra-Violet

THE long radiations of the ultra-violet group upon absorption produce a thermal effect. Abiotic activity does not become apparent until about 3200 A. U. and is most pronounced in radiations between 3000 and 2500 A. U. A critical threshold exists within the tissue both for intensity and wave length. To satisfy this requirement it is necessary that energy of the order of 2,000,000 ergs/cm^2/sec be incident upon the tissue (Verhoeff-Bell, Hill & Edinow). The degree of reaction varies directly as the dosage. Repeated exposures are additive provided they occur within a 24-hour period. Before repair sets in, a series of minor exposures throughout the work day may be as intense as a single large dose.

THE CORNEA: From a clinical standpoint the major effect of these radiations is seen in the cornea. After a latent period of six to eight hours, shorter in extreme exposures, the patient notices a sandy feeling in his eyes and, in rapid sequence, severe pain and watering. The pain may be so intense as to invoke spasm of the eyelids. Examinations of the eyeball shows the cornea to be dull and to have a stippled appearance to its epithelial surface.

With more intensive exposures the epithelium in the central region will be destroyed with the severity of the reaction subsiding as the limbus is approached. With very high levels of energy there may be a haze to the central portion of the corneal interstitial tissue.

The rate of repair depends upon the severity of exposure. Even in the most acute cases the height of the reaction occurs within 48 hours with complete restoration, and usually with no ill effects in a matter of a week or 10 days. It is of interest to note that in the thermal burn the cornea reacts throughout its entire area with the greatest effect in the posterior region, whereas with ultra-violet the reaction is most intense in the central region of the anterior surface. Lens changes resulting from ultra-violet are extremely rare. In an eye with the lens removed the retina may be damaged by these rays.

X-RAY AND RADIUM: The appearance of cataract following exposure to gamma rays is a well established clinical fact. The effect of these radiations is twofold:

1. Direct action on the lens.
2. Vascular changes in the iris and ciliary body so alter the chemical nature of the aqueous that the nutrition of the lens is interfered with.

Since these vascular changes are so slow, a long latent period in the development of these cataracts is to be expected. It is not unusual for a period of two years to elapse prior to cataract devlopment.

Following a latent period of variable length a rather dense, disc-shaped opacity is seen in the posterior cortex. This is surrounded by a ring of minute discrete opacities. Under the anterior capsule a few vacuoles and opacities appear.

The Electric Cataract

THE effects of lightning and electric currents are usually so disastrous to life that few studies have been made concerning the changes that occur within the lens. After a wait of one month to two years, opacities may appear in the capsule or just beneath it. These opacities may assume various forms.

The Methods for Control of Radiant Energy

THE various procedures for the elimination of infrared rays' harmful effects upon the eye are well known. These rays penetrate plain glass with ease. The introduction of iron into the formula of glass offers excellent protection. Sir William Crookes developed a series of ferric oxide lenses capable of filtering out most of these harmful radiations yet transmitting sufficient amounts of the visible to permit the wearer to see to get about. To offset this drawback the level of illumination of the plant may be increased to permit greater safety in the movements of the workman.

To protect the eyes from ultra-violet light, a series of cobalt lenses of increasing densities are available. As the intensity of energy output is increased, filters of greater absorption power must be utilized by the welder.

Gamma radiations have such tremendous penetrating power that lead or leaded safety equipment must be available for the protection of the worker. The effects of these radiations are cumulative. A slight exposure from day to day may be quite disastrous.

TREATMENT: When cataract develops, its removal is the only form of treatment. The type of surgery depends upon the etiological factor.

Ultra-Violet: Pontocaine (never cocaine) in .05% solution promptly relieves the pain. It may be instilled several times a day. Bland oils and ointments offer some relief. Homatropine 1% solution quickly relieves the iris spasm but its use should be restricted owing to the possibility of a glaucomatous attack being precipitated. Ice compresses applied for 15-minute intervals will alleviate the swelling.

A Health Program for the Merchant Marine

—Convalescence and Rehabilitation—

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THE THEME of this section of your course is preparation for the return of our men who have gone away, with special consideration for the part that will be played here at home in their future welfare. The inclusion of the members of the Merchant Marine in the problems of service men is logical and necessary, for this relatively small group have found themselves catapulted into direct contact with the enemy on every sea and in every war-torn harbor and beachhead.

On the other hand, men of the Merchant Marine have remained private members of an industry, one of the most important in the transportation field. In this capacity, their problems are similar to those of personnel on the home front. They are pulled one way by deep and sincere patriotic motives, and the other by individual necessity to meet personal obligations.

The special problems of this group in the field of convalescence and rehabilitation are therefore related both to the members of the armed forces abroad and to private industry on the home front.

What lessons can be learned from experience in the Merchant Marine during this war? To answer this question one must have knowledge of certain unique features of this industry.

Historically, it is among the oldest industries. Use of vessels for trade goes back to antiquity and precedes the use of vessels built only for fighting. In the early days of our history, commercial shipping was quickly converted to armed merchantmen or privateers, which formed the great bulk of our armed fleet. Recognition of the part played by merchant ships has been valuable.

Shipping was important in the last world war but our record as a shipping nation fell to all time lows when the disintegration which followed saw us revert to an inferior place among cargo carriers of the world. This war has produced an even greater need for shipping and transportation. The difficulty of supplying sufficient ships to carry men and supplies is a constant threat to the war effort. This has focused attention on men, as well as ships, and has already resulted in advances in care and conservation of this important segment of manpower.

Conditions on merchant ships have been notoriously bad from time immemorial. Food, living quarters, wages, compensation and security have lagged behind every other industry. This is illustrated by conditions reported in Boswell's "Life of Samuel Johnson."

Dr. Johnson, concerned that a devoted servant had reportedly been impressed into the merchant service, stated in 1759, "No man will go to sea who has contrivance enough to get himself into a jail, for a ship is like a jail, with a chance of getting drowned. Furthermore, in jail, one has more room, better food, and usually better companions." American ships have taken the lead in amelioration of these conditions. But, due to the stress and strain of wartime condi-

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tions, our men continue to succumb to disease in spite of improved physical conditions on board ship.

Seagoing personnel in the maritime industry numbered about 55,000 at the time of Pearl Harbor and has grown to 179,000. Over 40% consists of young men brought in through the new government training schools; the rest are the old timers who formed the bulk of the service in 1941, together with other old timers who had left the sea and were comfortably installed in shore jobs. More than 40,000 of these men, all in the older age brackets, left their shore employment and answered the call to meet the emergency. No greater examples of American patriotism exist than these older men who voluntarily have left their homes and good shore jobs to face physical breakdown, injury, and loss of life in a little known part of modern war.

Men of the Merchant Marine differ widely in age. In no other group facing the enemy will you find men whose ages vary from 16 to 80. There are large numbers in the fifties, the sixties, the seventies, and two or three, whom I know personally, are in the eighties. Citizenship is not always required and many aliens are in our service. Except in certain companies there have been no standards of admission in the past. There have also been no permanent benefits such as social security, employee's compensation, insurance schemes, or provisions for old age and permanent disability.

There are 11 maritime labor unions, which have organized virtually the entire industry. Some are old and settled unions. The largest is young and still in its developmental stage. Whereas just now the government controls the ships and directs all activities, the shipping industry is in charge of several hundred operating companies. Uniformity of effort and standards is on the way but has not come far. Men are employed for one voyage and when a man signs off he is free to do what he pleases within the restrictions of Selective Service and his own conscience. Much praise is due these men who have remained on the job and kept the ships sailing. There has been no strike in any maritime union.

The most important fact in the understanding of the merchant mariner is the matter of being at sea, in and out of port, a large part of his working life. This fact has had far reaching consequences. It has cost him many of the possibilities of home life, marriage and permanent ties. It has deprived him of legal residence in cities and states, and usually the ability to vote. It has made him a wanderer on the face of this earth and has promoted any tendencies to avoid responsibility, to make no provisions for the future, to be careless with money. It has naturally attracted many kinds of men including the finest types; but it has tended to keep at sea only the man who is willing to put up with such an abnormal life. The superior men have usually gone on to a license and they have furnished the service with good officer personnel.

One positive result of the seafaring life is that the seaman has been accorded a special legal status, perhaps in recognition of his contribution to the nation's welfare and of his value in time of war. A seaman is therefore a "Ward of the Admiralty" in the British Empire and in certain other countries. In the United States he is a "Ward of the State" and his welfare is regarded as a Federal responsibility.

This status is legal but its chief perquisite is medical. All merchant seamen get free medical care in the Marine Hospitals of the U. S. Public Health Service. This medical care is available in many large hospitals, and 125 clinics in all ports and most large cities in the United States. While this is advantageous, there are certain features inherent in the industry which operate to lessen the benefits. Eligibility must be maintained, and is strictly defined. Men sign on only for a single voyage, with some exceptions; and most employer's responsibility ceases at the end of the voyage. In between trips the seaman is on the loose. His family gets no special care, nor are his dependents accepted in Marine Hospitals on payment of a fee. Convalescent periods must be faced with no official help to lean on. Chronic disease requiring long continuous treatment ashore makes it impossible to earn an income at his sea-faring trade.

The incidence of disease at sea has always been high. Dr. Gwynn Maitland, Medical Director for the Cunard-White Star Line, and one of the leading authorities on health in the merchant service, asks the question: "Why does a healthy man go to sea and in five years or less become an unhealthy man?" Days of hospitalization per man per year are high. Loss of all teeth in men over 30 is common. Tuberculosis takes a heavy toll.

Our seamen come from all parts of the United States as well as from other countries. Their family backgrounds represent a good cross section of American life, including homes of culture, intellectual background, wealth, all the trades and professions. Men of the Merchant Marine are like men in any armed service. Take the uniform off an Army or Navy man and you can't tell them apart from a merchant seaman. It is chiefly in the preponderance of older men and the presence of men who are half crippled that the Merchant Marine personnel differ from the Army or Navy. The younger, amateur, temporary wartime seamen are even more like military service men.

The problems, therefore, of the men returning from Merchant Service to peacetime industry are essentially the same as those of the Army. It is fair to assume that observations made of these men will be valid for men in the armed forces; that what will be good for these men also will apply to others returning from no matter what service; and that suggestions pertinent to families of returning merchant seamen will be of equal value to families of men in the Army, Navy, Marines or Coast Guard.

Program of Rehabilitation

WE ARE dealing with a general concept of rehabilitation as a recuperative process, and not with vocational rehabilitation which is another subject.

Rehabilitation especially organized to return men to their ships is one of the branches of the overall medical program of the War Shipping Administration as described by Assistant Surgeon General Justin K. Fuller. Since the summer of 1942 special plans have been in operation. Chief war casualty is the victim of ship disaster who after rescue must be brought back home and restored to good health and restoration of his property, job and future. Casualties occur not only from torpedoes, but from bombing and strafing in convoy, mines, and shell-fire on invasion beachheads. Less dramatic, but just as deadly, has been the slow attrition of physical and emotional energy due to constant wear and tear, strain of blackout, danger of collision, the constant waiting for an explosion. Many of these men did not break until after arriving at home ports. As time went on their general health began to give way and more and more illnesses appeared. Treatment and rehabilitation were concerned, then, with victims of shell-fire, ship disaster, general illness, and operational fatigue. Men were appearing in all parts of the world and the problem of medical care was solved by arrangements with

our Army and Navy hospitals now found in all these areas.

Victims of ship disaster suffered from exposure and often wounds; but the most important element was the psychic trauma incurred. Those suffering from continued nervous strain fell into the same category. We found also that men succumbing to constitutional disease also had a strong psychic component in the total picture of their illness. As one would expect, anxiety and fear, coupled often with suppressed aggression due to frustration, were present in nearly all men and especially in those who had succumbed to violent experiences or physical disease in the war situation.

Owing to the importance of reassurance, personal aid, and competent care, arrangements were made for representatives of the War Shipping Administration or United Seamen's Service to take personal care of every merchant seamen waiting transportation home. They follow the man through his experience in Army or Navy overseas and make arrangements for transportation. They forward his medical record, take care of his baggage and personal needs, get an advance in his pay, and notify the Washington office of his impending arrival on a certain vessel or plane.

Our repatriate is again taken over on arrival at a United States port by representatives of the Recruitment and Manning Division of War Shipping Administration. One of our doctors goes on board to greet him and give him reassurance and help in his health problems. We are confident that anxiety about the integrity of the body-mind machine is inherent in any man. The presence of a doctor from his own service plays an important part in his welcome home. Repatriates and those who need extra medical attention, outside Marine Hospitals, find W.S.A.-U.S.S. Port Medical Offices set up in 13 major ports. Doctors and medical social workers are present, devoted entirely to seamen's problems and informed about their special needs. These offices are located near shipping centers in each port, near government, union, and U.S.S. offices, convenient to all seamen. These offices are the centers for all services, outside the Marine Hospitals, which relate to medical diagnosis and referral. They also include medical social service which attempts to give a man what he needs or refer him to the right place with a minimum of run-a-round.

Merchant Marine Rest Centers are the pivotal point in the convalescent and rehabilitation program. With the predominance of psychological factors affecting all our men, it was logical to emphasize psychiatric treatment in these centers—though this was not the only type of treatment, especially since war nerves responded best outside of hospital atmosphere. The Rest Center is a combination of convalescent home and treatment center, but it has several unique characteristics. Because atmosphere is important, our men are not exposed to either extremely ill or chronic cases. Since we believe that sufferers from war nerves are easily cured and that environment is important, every effort is made to have the expectancy of an early return to sea a predominant thought in the minds of all. A three-week limit to the stay is enforced; strong pressure, suggestion, and every psychological device are employed to aid in throwing off the temporary malady. Each activity is carefully evaluated during the patient's stay. Behind this atmosphere is a doctor, who has had special training in psychiatry as well as all around medical experience, and who is experienced in therapy, especially interested in emotional ills of the normal individual, and possessed of a magnetic personality which appeals to this type of patient. Nurses in civilian dress perform what appear to be casual friendly services but their judgment is backed up by extensive experience with emotionally ill people. Specific treatment is carefully selected, often emerging as a single interview or a slap on the back. We are fearful of complicating the relatively simple reaction to a war experience by failing to hold within bounds, or allowing the reaction to spread over to the total personality. When necessary our doctors use deep narcosis, or narcosynthesis, sedative drugs, physiotherapy, modified psychoanalysis. Exceptional skill is needed to know when to inject a drug and when to pat a man on the back.

Food plays an important part in therapy. Men get three large and three supplemental meals a day. In our experience, gain in weight usually accompanies general improvement in emotional conditions. Rapid loss or gain of weight suggests that there is something more related to the war neuroses than the known physiological and psychological values of food. Special studies should be made to learn more about this undetermined factor.

Work-Recreation is our name for occupational therapy. That is administered by volunteers in five Rest Centers, by part-time paid staff members in two. We do not graduate occupational therapists because our units are too small, and because occupational therapists are difficult to get.

Perhaps equally as important as the ministrations of doctors and nurse, or the use of food and rest, is the tremendous ego-strengthening asset that is given these patients by participation in community cooperation. The presence of United Seamen's Service volunteers and carefully selected older people and girls from the immediate community does more than anything else to make the merchant seaman realize he belongs in the American family, and that what he has done is really appreciated. On the other side, the community also profits. Here is a way of joining in the war effort, of understanding what men go through by knowing them and working with them. Our goal here is the adoption of the Rest Center by the community and adoption of the community by the men in the Rest Center.

A third leg on which our program stands is health education. This is largely preventive medicine. There is a therapeutic side to this effort also, for instruction about a disease while one has it brings about an understanding necessary to following doctor's orders. It is also psychological treatment because with understanding, fear and ignorance are removed. To a degree this is psychotherapy.

Health lectures and discussions are carried on in Rest Centers where men are under treatment. Here pain and symptoms of disease are related to the basic sciences of anatomy and physiology and are explained through various educational methods and materials. Special emphasis is laid on psychosomatic conditions, the inter-reactions between emotional feelings and bodily organs.

The greatest audiences are, however, composed of seamen in union hiring halls, Marine Hospitals, U.S.S. hotels and all places where seamen gather. Selected speakers present subjects related to tropical diseases, tuberculosis, venereal disease, war nerves, and safety at sea. These talks characteristically produce free discussion. They are increasingly popular—over 15,000 seamen in New York have attended such meetings. It is hoped that the entire industry will be reached by working in all ports around the three coasts.

What suggestions may be drawn from this program that will aid in the rehabilitation of men from all services?

1. Small therapeutic and convalescent units are recommended. These should emphasize personal attention, well balanced daily schedules to meet physiological, nutritional and psychological needs, with strong suggestive atmosphere favoring speedy return to normal competitive, social life. This return to normal life is to be aided by the reciprocal interflow of interests in Rest Center and community.

Such small community units would be valuable for men unable, or not ready, or waiting to start vocational rehabilitation. Men finding adjustment to civilian life difficult could be sent to such a country place for a brief course in how to live a balanced life and how to manage some of their chief problems. The cost of these small simple institutions can be made economically acceptable. The burden of rehabilitation can be shared by workers in the community who will be as willing to share in postwar problems as they now are in volunteer war work.

2. Our Repatriation Plan suggests the advantage in following a man from overseas back home, or from army discharge, to his home town with personal attention to transportation, baggage, and other needs. He can be met on arrival and given information as to how and where he can find answers to the many questions which correspond to the seamen's questions about rationing, back pay, war insurance, draft status, benefits and privileges provided under the law and by the community. Someone should make sure that he gets a welcome either from family or friends and also some recognition from the municipal or town government, to make him feel at home and to offer him the keys to the town.

3. Our Port Medical Offices should have their counterpart in civic information centers, at least one in every large city and town in the country where courteous information is available on all pertinent subjects. If the center also provides medical and legal aid on the spot, it will be that much more functional.

4. Health education embodies certain principles that would be useful to both returning service men and their home town friends. *Knowledge* lessens fear and anxiety. As we say in our literature, "Any fact may save your life." Even if information discloses unpleasant facts, it is better to face reality and work on the solution to the problem, than to have the added anxiety of uncertainty. *Anticipation* of coming events allows for thinking and planning. It allows emotion to be drained off early so cold intellectual appraisal of facts can take its place.

Working with groups takes advantage of the average man's desire to be in the company of other men in the service, to loaf with them, chew the fat, keep from being lonely. A series of talks, repeated at intervals, would be well accepted by service men for it would draw them together.

Also since many problems would be common to all, these meetings would produce a further cementing substance and would prepare the men to accept and put to use the information presented.

The most important subjects treated in group discussion would be man's emotions and the guides to handling them. Psychological problems meet with prejudice which is usually based on fear of what they imply. They are a part of the total life picture and should always be oriented in the framework of common knowledge. The service man and his homefront counterpart, and the families of both, need more and more knowledge on the handling of their emotional experiences.

Ours was not intended to be a program solely for psychiatric rehabilitation. It has embraced all needs of men in medical, economic and social categories. It has demonstrated, however, the profound truth that a very large part of man's needs lies in the field of his emotional reactions.

No program of rehabilitation will succeed unless it gives marked attention not only to what men do, but to what men think and feel about what they do.

Pre-Placement X-Ray Examination of the Lower Back

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DURING 1944, we began taking routine roentgenological studies of the lower back as part of our pre-placement examination. These examinations consisted of two exposures, antero-posterior and lateral, of the entire lumbar and sacral regions. Added studies were occasionally made in special cases. A tabulation of the findings in 1,000 consecutive examinations will be found in Table I. The average age was about 35 years. There were 856 defects and anomalies revealed in 498 cases; 502 cases were considered normal.

Similar studies made by both Bohart,[1] and Cushway and Maier[2] in 1929 revealed similar findings of 44% and 45%, respectively, abnormal examinations. Bohart felt that these variations from the normal did not result in any increased tendency to injury or lengthened disability over the normal with the one exception in those cases showing "lipping and spur formation." Cushway and Maier concluded that the variations from the normal back were not necessarily painful, but the procedure of routine pre-placement x-ray examinations of the back not only prevented the employment of those unfit for certain types of work, but would also insure just compensation to the injured.

From our initial series of back x-rays, as seen in Table I, we are unable to prove medical significance of our findings as our follow-up on these cases was over too brief a period of time.

Table II shows three contrasting series, each of 100 back examinations. The first was pre-selected, all these cases having either signs, such as scoliosis or limitation of flexion, or history of possible back trouble. The

TABLE I.
ANALYSIS OF 1000 X-RAY EXAMINATIONS OF THE LUMBO-SACRAL SPINE*

TOTAL CASES	1,000	
Normal	502	
Abnormal	498	
Scoliosis only	25	
Scoliosis with other defects	114	
TOTAL CASES WITH SCOLIOSIS		139
Spina bifida occulta, 1st sacral segment	180	
Spina bifida occulta, 5th lumbar segment	27	
Spina bifida occulta, 2nd sacral segment	7	
TOTAL SPINA BIFIDA OCCULTA		214
Arthritic changes	173	
Transitional 5th lumbar vertebrae	86	
Narrowed lumbo-sacral joint	57	
Hyperlordosis	57	
Transitional 1st sacral segment	49	
Six lumbar type vertebrae	23	
X-ray evidence of trauma or fracture	21	
Spondylolisthesis	16	
Posterior slipping 5th lumbar on sacrum	12	
Other congenital deformities	7	
X-ray evidence of spinal operations	2	
TOTAL DEFECTS AND ABNORMALITIES		856

This study was made at the Colts' Patent Firearms Mfg. Co., Hartford, Connecticut.

TABLE II.

	100 Pre-selected (all with signs or history)		100 Consecutive (36 with signs or history)		100 Pre-selected (without signs or history)	
Entirely normal		17		31		36
Scoliosis only	17	*17*	11	*11*	12	*12*
Essentially normal		34		42		48
Scoliosis with other defects	*32*		*15*		*15*	
Total Scoliosis	49		26		27	
Hyperlordosis	10		7		4	
Spina bifida occulta 1st sacral segment		19		30		33
Abnormal lumbo-sacral articulation		18		19		12
Narrowed lumbo-sacral joint		14		12		5
Spondylosis (traumatic and otherwise)		9		3		2
Transitional 5th lumbar		7		8		3
Productive changes sacro-iliac		6		2		0
Evidence of trauma or fracture		5		1		0
Transitional 1st sacral segment		4		5		1
Spondylolisthesis		4		1		1
Spina bifida occulta 5th lumbar		4		0		1
Posterior slipping of 5th lumbar vertebra		2		2		0
Six lumbar type vertebrae		*1*		*7*		*5*
TOTAL Anomalies and Variations		93		90		63

second group is of 100 consecutive cases (36 having signs or symptoms). The third group consists of 100 cases in which no evidence of back difficulty was elicited. The age factor in these three groups is quite constant, since all of them are returning servicemen. Because of the relatively small number of cases recorded in Table II, too many conclusions cannot be drawn, but one can see that the group which has symptoms and/or signs of back difficulty shows a larger incidence of arthritic changes, scoliosis, spondylolisthesis, spina bifida occulta of the 5th lumbar vertebra and evidence of trauma or fracture.

Virtually every variation and anomaly of the lower spine recognized in the literature has been cited as a cause of low back pain. Little, if any, study has been made of the morbidity of symptoms arising from these various defects. This would be very important to industrial medicine in increasing the accuracy of its preplacement examination. However, some leads as to the significance of these abnormalities may be inferred from the literature, and a brief summary of some of this material will be given.

Lewin,[3] in his textbook on "Backache and Sciatic Neuritis," cites many anatomical variations which predispose to a weak back and to back pain. Goodwyn[4] believes that many back anomalies are a definite source of pain when aggravated by injuries or affected by toxemias and that, in the presence of such anomalies, disability may result without any injury. In his book on "Occupational Diseases," Johnstone[5] states that one reason why some individuals with back abnormalities may experience no discomfort and others considerable disability may be based on the condition of muscles and ligaments, their tone and strength determining how well they may support the lumbo-sacral region. In general he feels that persons with structural defects and mechanical weakness have a lessened capacity to engage in occupations requiring the use of the lower back.

SPONDYLOLISTHESIS. This defect consists of a forward slipping of one vertebra on another (Fig. 1). It is almost always seen at the lumbo-sacral junction where the fifth lumbar vertebra is allowed to slip forward on the sacrum. For this to take place, there must be an interruption of the continuity of the lamina of the vertebra. While this is theoretically possible as a result of trauma, according to Willis[6] and others,[7] it is usually due to a congenital defect in the lamina at the isthmus, which is the narrowest portion of the lamina, and results in the division of the vertebra into two separate pieces of bone if the defect is bilateral. This is held together by a fibrous union and has been called

Fig. 1.
Rather marked spondylolisthesis of 5th lumbar vertebra with obvious laminar defect in 22 year old male with history of a fractured pelvis but with no residual complaints at time of examination

Fig. 2.
Spina bifida occulta defect involving all sacral segments and producing a deformity of the posterior neural arch of the 5th lumbar vertebra in 26 year old male with no history of back pain and no clinical signs of back abnormality

Fig. 3a.
Spina bifida occulta defect of entire sacrum with marked enlargement of the 5th lumbar spinous process and absence of spinous processes in sacral region in 28 year old male with no history of back pain and clinical findings of increased lordotic curve

Fig. 3b.
Lateral view of case shown in Fig. 3a with the large spinous process of the 5th lumbar vertebra outlined

prespondylolisthesis. As a result of superimposed, either single, or multiple-small, trauma, this fibrous union may give way allowing the body of the 5th lumbar to shift forward. We have seen cases where this forward slipping has occurred without any history of trauma and without causing symptoms. Meyerding[8] reports that 10% of all cases which were diagnosed as having spondylolisthesis at the Mayo Clinic had these findings without symptoms. But 70% of the cases that did have spondylolisthesis, and had symptoms associated with the finding, had done hard work. Our experience indicates that backs with this condition will decompensate in a relatively short period of time when placed on laborious work. We are of the opinion that these patients should be permitted to do only sedentary and light work. Although spinal fusion is generally believed the method of treatment in these cases, Dandy[9] has recently reported good results in a series of 20 cases that were treated by the removal of multiple intervertebral discs.

SPINA BIFIDA OCCULTA. This is a developmental defect wherein there is incomplete fusion of the posterior neural arch. We have seen all degrees of it from a small defect in the first sacral segment to a failure of closure of the posterior neural arch in the entire sacrum and 5th lumbar vertebra (Fig. 2). Dittrick[10] states that this anomaly is invariably accompanied by pathological alterations within the spinal canal. His dissections have shown fat and fibrous tissue in close contact with the nerve roots so arranged as to produce mechanical irritation of the nerves. He has reported a series of cases where low back pain with sciatic radiation has been relieved by the surgical removal of this tissue. We have seen cases where mechanical weakness of the lumbo-sacral joint may be presumed to exist because of an associated malformation of the spinous processes. Some cases with a spina bifida occulta defect of the 1st sacral segment will show no spinous process for this segment but a hypertrophied spinous process of the 5th lumbar vertebra (Fig. 3, a, b). The added stress that would thus result at the lumbo-sacral joint could theoretically give rise to back symptoms. The fact that this defect may be found in 20 to 30% of all backs leads one to minimize its importance. In time we may learn what degree of the spina bifida defect is innocuous and thus be able to evaluate it in terms of work placement. At the present time we were unable to do this.

SACRALIZATION OF THE LAST LUMBAR VERTEBRA. Various degrees of sacralization of the last lumbar vertebra are common, occurring in about 8% of all cases we have examined. A complete sacralization is probably of no importance, but the transitional types may be of significance. If there is fusion of only one transverse process, Goodwyn[4] feels that rotary torque injuries may give rise to symptoms. Tolmach[11] states that this abnormal joint is commonly the site of arthritic changes, and, if superimposed trauma takes place, the clinical picture tends to be prolonged.

NARROWED LUMBO-SACRAL JOINT. Frequently one sees narrowing of the lumbo-sacral joint associated with transitional types of last lumbar vertebrae. There are, however, other cases which have narrowed joint spaces that are not associated with any specific developmental defect (Fig. 4). One must presume that there are associated changes in the intervertebral discs, but, in our series, these cases do not necessarily give histories or clinical findings associated with the disc syndrome. In cases with low back pain with sciatic radiaton, Badgley[12] has found 57% show narrowing of the lumbo-sacral joint space, and he feels this is significant in the production of that symptom complex. Wil-

Fig. 4.
Markedly narrowed lumbo-sacral joint space in 24 year old male who has no history of back injury or pain and marked limitation of flexion on physical examination

liams[13] describes this defect as due to chronic traumatic or postural destruction of the intervertebral disc and results in a constriction of the foramena with resulting nerve pressure. That it may be a factor can be seen from Table II where we found it in 14% of the cases with signs and/or symptoms of back trouble and in only 5% of the small series with no history of back complaint.

EVIDENCES OF TRAUMA. About 1% of our series of cases in Table I showed x-ray evidence of trauma as signified by compression changes and deformity of the vertebral body or by arthritic changes limited to a single intervertebral joint. In Table II, of 100 cases with history of back complaint or signs, such as scoliosis or limitation of flexion, 5% showed x-ray evidence of trauma. However, we have seen several cases recently with negative histories and clinical findings showing deformities of the bodies of lumbar vertebrae indistinguishable from old fractures. These cases possibly may be the result of childhood injuries or more likely related to Scheuerman's disease (osteochondritis deformans juvenalis dorsi). X-rays on these cases following a severe injury might well be diagnosed as having fractures. The implications of this in pre-placement examination are obvious as it is only by such examinations that traumatic changes in the lower spine can be dated within the period of employment.

ARTHRITIC CHANGES. X-ray signs of spondylosis are frequent. In an average cross-section of cases in terms of age as represented in Table I, over 17% showed arthritic changes, mostly hypertrophic in character, and, as would be expected, this was concentrated in the older age group. In the younger age group, represented in Table II, virtually all in the third decade, 14% of those who had back complaints showed early productive changes—whereas in only 2% of the asymptomatic group and in 5% of the consecutive series were these findings made. It is well known that the majority of cases with hypertrophic arthritis are capable of vigorous work and do not have complaints. However, we have observed that when patients in this group do sustain back injuries, they usually have prolonged disability. Ghormley,[14] Tolmach,[11] and Bohart[1] all agree on this point. It may be safely stated that injury to these backs frequently results in an aggravation of the underlying arthritis and produces symptoms and disability to a degree all out of proportion to the severity of the injury. With this in mind, its significance in pre-placement examinations is clear.

Other defects and anomalies, such as scoliosis, other congenital anomalies and variations in numeration, are mentioned only in that they are usually important only if associated with other more serious defects.

IN SUMMARIZING, we would like to emphasize the fact that anomalies and variations of the lumbar spine, especially of the lumbo-sacral joint, are extremely common. We feel that defects such as spondylolisthesis, arthritis, and perhaps some cases of spina bifida occulta and transitional types of last lumbar vertebra, are important in the placement of workers in industry. Our observations over a five-year period in one industry lead us to believe that these deformities may play a significant role in the decompensation of backs in the age group over 45. We have seen many such cases who have been barred forever from resuming their accustomed occupations following apparently minor back injuries. We feel that careful consideration of these abnormalities should lead to a better accident experience in industry. However, to establish definitely the relationship of these congenital anomalies, variations and defects of the lower back to back decompensation, further study is needed to develop morbidity figures and their correlation with job placement. Even with our present knowledge, we feel this type of examination is helpful and practical.

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HOSTILE organisms account for eight deaths out of 10 in Middle America, as against three out of 10 in the United States. To combat these organisms and to improve the general health of the 10 countries in which the company functions, United Fruit maintains a medical department of approximately 1,100 people, including 137 nurses and 110 technicians.

—From an address by A. A. POLLAN, Executive Vice-President, United Fruit Company, *Milford, Connecticut, Citizen*, February 7, 1946.

The Treatment of Injuries to the Hand

—With Particular Reference to Nerve and Tendon Repair—

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SUCCESS in reparative surgery of the hand depends first of all upon primary reactionless healing. Each injury should be considered from the standpoint of its reparative powers and our surgical procedures determined accordingly. Primary nerve and tendon repair, if successful, gives better results than secondary, but secondary repair after unsuccessful attempt at primary suture is very difficult and often hopeless. On the other hand, a wound which has healed by primary intention may be reopened in three to five weeks and divided nerves and tendons sutured under ideal conditions with excellent results. There is no criticism of the surgeon who deliberately omits suturing nerves and tendons if the ideal conditions for repair are not present.

When confronted with a fresh nerve and tendon injury the surgeon must decide if conditions for immediate repair obtain. This decision is reached largely on a consideration of time since injury, degree of possible or probable contamination, and extent of associated tissue damage.

In wounds over two to three hours old when first encountered it is not advisable to suture divided tendons, especially if these are sheath enclosed tendons on the volar surface of the fingers or in the carpal tunnel. One may occasionally overstep this time limit somewhat in the case of dorsal tendons where there are no sheaths and in which there is not a great deal of retraction of tendon ends requiring wide exposure for isolation.

In case of nerve injuries an end to end suture may be accomplished up to six or eight hours after injury since identification and mobilization of nerve ends usually do not require extensive dissection.

Even minor degrees of inflammation may vitiate nerve and tendon repair, and critical judgment is called for in deciding whether or not the degree of wound contamination is such as to contra-indicate immediate repair. The history of the wound should be gone into carefully to determine the sources of contaminants. Exposure to virulent bacteria may have taken place at the time of injury, e.g., the knuckles from tooth injuries in fist fights. In this, as in certain other rarer injuries, the immediate innoculation of virulent pathogens contra-indicates nerve and tendon repair.

More often, however, serious contamination is secondary from droplets, fingers or unsurgical dressings at some stage of the primary care. In those cases in which it seems likely that there has been undue exposure of the wound, deep repair is inadvisable.

A previous attempt at repair, for example, in an emergency room or aid station by unskilled or unprepared hands, under questionable conditions of asepsis, precludes primary nerve or tendon repair. Such an attempt is likely to have led to such traumatization and soiling of the tissues that, even if infection does not develop, healing will be so disturbed that functional results can hardly be expected.

Loss of skin and covering tissues over the site of nerve and tendon damage render repair impossible. These defects must first be covered over with suitable skin and allowed to heal. In many cases flaps must be transferred to provide an adequate bed for future nerve and tendon suture or graft. Such cases are perforce reserved for secondary repair.

Favorable operating conditions must also obtain. These procedures are not to be undertaken in an emergency room equipped to deal only with minor lacerations. Good assistance must be at hand; proper instruments and suture materials, an anesthetist, good lighting and plenty of time are essential. Ideal operating room conditions are indispensable. Probably few fields of surgery demand such care and painstaking attention to details in order to secure satisfactory results.

It was hoped that the use of sulfonamide drugs as local application into wounds would prolong the safe period of operation and might even compensate for the presence of a certain amount of virulent contamination. The careful survey of wound care supervised by Meleney produced "no evidence that they (the sulfonamides) lessened the incidence of local infection when used as we have employed them." It seems likely that the beneficial effect of sulfonamides is due to the general and not local action of the drug. Experiments with tendon repair by Dr. Allen and myself have shown that the local implantation of sulfanilamide, sulfathiazole or sulfadiazine lead to excess reaction at site of repair and a retardation of healing process. The Medical Department of the U. S. Army, after extensive trial in the early days of the war, issued a directive advising against its local use. Since primary healing is necessary for successful tendon repair, it seems obvious that there is no place for the local implantation of sulfonamide drugs in nerve and tendon repair.

It has seemed to me that one great benefit which the sulfonamides have produced has been the critical study of wound healing which they have stimulated. With attention focused on wound healing the surgeon has become increasingly cognizant of other important factors in repair, and to this may be ascribed much of the improvement in the results of the surgery of trauma.

Penicillin as a local application is not extensively used in this country. Its beneficial results are due to the general effect of the drug administered intramuscularly or intravenously. No one claims that its use permits disregard of surgical principles, that it permits extensive operation within an infected or badly contaminated field, or compensates for the presence of devitalized tissues. It does cut down the incidence of spreading infections and favors wound healing. Since penicillin has lowered the incidence of spreading infections, it seems not at all unlikely that many wounds which would have developed severe spreading infections have not done so and were, therefore, more amenable to earlier secondary repair than they would have been otherwise.

The general principles of wound care apply to injuries to the hand as elsewhere. The objectives of first aid care are to protect the wound from further trauma and contamination, to provide immobilization, and to control bleeding, swelling and induration. These indications are met by a voluminous resilient pressure dressing and a splint, which are left on until the patient arrives in the hospital or properly equipped emergency room. Inspection of the wound is avoided unless very definite indications are present and then only under aseptic precautions. Diagnosis of extent of damage and probable requirements for repair may usually be accomplished by inspection of the hand without removal of the protective dressings.

The transformance of the contaminated wound into a clean surgical wound is accomplished in the operating room, under operating conditions by careful soap and

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water washing and saline irrigation. By washing is meant actual washing with suds and large cotton squares, gently but thoroughly, for a full 10 minutes or longer.

Following cleansing, the hand is draped and devitalized tissue is excised. Complete wound excision is not only unnecessary but impossible; the objective is not decontamination of the wound (this is accomplished by the washing and irrigation), but the removal of tissue destined to become necrotic. This exceedingly important step in the care of the wound was emphasized more strongly than ever by experiences in the recent war. It is hardly necessary to stress the need for great care in this excision in the case of the hand.

Closure of the wound by suture or skin graft completes the operative part of the procedure, but the operation is not completed until a proper dressing and splint have been applied. The pressure dressing which follows the operation is one of the most important steps, and on its correct application will often hang the fate of precarious skin flaps and the occurrence or absence of edema with its subsequent functional disturbance. Too often this part of the operation is relegated to an inexperienced assistant. Splinting also must be carried out to keep the part at rest during healing, to relax muscles paralyzed by nerve division, to keep suture lines of nerves and tendons free of tension during the important post-operation weeks.

Secondary nerve and tendon repair should be undertaken as soon as the condition of the wound permits reopening. There must be no infection present. If the patient is seen for the first time the surgeon should question him very carefully as to wound healing to determine whether or not there has been infection, how long it was before the dressings were removed, how long he was hospitalized, whether or not there was drainage, when the sutures were removed, etc. From questions of this sort the surgeon can gain some knowledge as to development of infection following the injury. If the wound was known to have healed by primary intention, or if the history indicates that such was the case, it may usually be reopened within three to five weeks and repair carried out. If there was some minor disturbance in healing, if the wound healed with minimal discharge or a stitch abscess, a period of several months should elapse between final healing and secondary repair. If a severe infection was present a much longer period of waiting, 12 months or more, is necessary.

It seems likely that the use of penicillin, in reducing the incidence of spreading infections, has made earlier secondary closure feasible in many cases.

The induration must have left the wound and tissues must be soft and pliable before it is advisable to reopen them for secondary repair. It is not only nearly impossible to isolate nerves and tendons in edematous indurated tissue, but repair is difficult and healing almost certain to be disturbed.

The joints to be moved by the tendons must be freely movable passively, otherwise the freshly repaired tendons cannot be expected to move them.

The covering tissues of the hand especially over the site of proposed surgery, must be supple and normal and a good layer of subcutaneous fat present which can be laid back as a flap at the completion of the operation over the suture lines of the nerves and tendons. It is frequently necessary to replace scars and deficient skin by pedunculated flaps before secondary repair can be undertaken.

In preparing the hand for secondary nerve and tendon suture and waiting for the permissable moment to arrive, much can be accomplished by the patient himself. Warm soapy soaks for 15 to 20 minutes once or twice daily, the patient gently washing and massaging his injured hand, will accomplish a great deal in loosening up stiff joints and causing induration to absorb. Paralyzed muscles should be kept splinted in relaxation during this time, otherwise they will be irreparably damaged due to overstretching by their antagonists.

Secondary tendon repair may often be accomplished by suture, particularly if the operation can be undertaken within a few weeks after the original injury. If, however, many months have elapsed and a great deal of shortening has occurred, or if there has been an infection and tendon substance has been lost or fused in the resultant scar mass, the surgeon must resort to tendon grafts. Where the flexor tendons have been divided within the digital sheath in the fingers it is always necessary to replace them with a graft. In those instances in which the graft must lie within the digits the surgeon should avoid suture lines within the finger itself by replacing the whole digital tendon with a graft, securing it to the distal phalanx by some such method as that advised by Koch and placing the proximal suture line so as to lie within the soft tissues of the palm. In this way the tendon within the finger is smooth and has the best chance of developing a gliding mechanism.

Tendon grafts may occasionally be taken from the sublimis tendons to the fingers since in those cases where grafts are needed it is never feasible to repair both sublimis and profundus tendon. In most cases, however, the extensor digitorum longus tendons of the toes are used. Four segments of tendon 10 to 18 centimeters long may be removed from this source without disturbing the function of the foot. The tendons are removed in such a way as to leave on the surrounding areolar paratenon which we feel helps restore gliding to the graft after healing.

It has never seemed logical to us to place preserved fascia, amniotic membrane, vein segments, or tantalum cuffs about tendon or nerve grafts or about suture lines to serve as gliding mechanism. Just the opposite effect is produced. Adhesions are more dense and excessive fibrosis makes function impossible. Our experience with the substances noted above has been limited to operative correction of the sequelae of their use. It is my feeling that the only tissues suitable for grafting to preserve or form a gliding mechanism about tendons or "insulating" tissues about nerves are subcutaneous fat or gliding areolar tissue taken from the patient.

Brief reference may be made to the period of immobilization following tendon repair. Experimental studies and clinical experience have shown that tendon healing requires rest. During the first few days after repair the tendon ends soften and very slight tension causes complete separation of the stumps. Later on, up to the end of the third week, the tendon union shows increasing tensile strength but responds to function by excessive proliferation and a large bulbous union results. Function during this stage therefore works against the very ends for which it is instituted, i.e., gliding. After the third week guarded use may be safely started, provided overtension is not permitted. At this time also certain evidence from experimental work seems to indicate that function leads to a more rapid increase in tensile strength, probably another example of Wolf's law. Full unguarded use of a sutured or grafted tendon, however, should not be permitted before eight to 10 weeks after surgery.

Nerve repair presents a number of problems to the surgeon, foremost among which is the recognition of

the presence of nerve damage. It is not necessary to go into the details of the diagnosis of radial, ulnar and median nerve division. If division has occurred, the condition can usually be recognized. Division of the digital sensory rami is sometimes missed largely because it is not kept in mind in making the examination. In those instances in which a nerve suture has been performed and in which there is some question as to whether or not regeneration is taking place the surgeon can easily delude himself into thinking that signs of nerve return are present. It has been our experience that it is wise, in case of doubt, to explore the site of damage and we have invariably discovered some pathologic process which requires correction.

The same prerequisites apply to secondary nerve repair as to secondary tendon repair, e.g., absence of induration, a soft skin flap over site of proposed operation, and absence of secondary infection. It is to be hoped that the paralyzed muscles have been kept supported in relaxation during the interval since irreparable damage may occur by overaction of unopposed antagonists. This same splinting should be kept up after operation until the function of the muscles has been restored.

Tension at the suture line is a potent source of saparation and fibrosis. It is usually necessary to mobilize nerve trunks well above and below the site of injury in order to secure union without tension. In those instances in which end to end apposition is still impossible despite the usual methods of extensive mobilization, acute flexion of the joints, transference of the ulnar nerve, etc., two recourses are open. In some cases, such as those with radial nerve injury, tendons may be transferred from the flexor to the dorsal surface to substitute for the paralyzed muscles; or a tendon transference may be made to the thumb to replace the lost muscles of the thenar eminence. Some surgeons report successful instances of transference of the sublimis tendons into the extensor expansion in cases of ulnar paralysis. Nerve grafts, while highly successful in the experimental animal have not proven so satisfactory in man. Bunnel, however, has reported very favorably on nerve grafts in the hand and very recently Davis and Perret have presented four carefully studied cases of nerve graft in the lower extremity, in which evidence of return of function is present. It is the feeling of these two surgeons that patients with nerve grafts require a much longer period for regeneration than has been realized and that conclusions as to successful re-establishment of continuity can be made only if the patient is examined at frequent intervals over a period of years. With the great number of nerve injuries as the result of the past war, it is hoped that methods of successful grafting can be developed.

Resume

IN RESUME, successful nerve and tendon repair depends, above all, upon primary healing of the accidental or operative wound, and should never be undertaken if satisfactory healing is not anticipated. Secondary repair in a cleanly healed wound may be accomplished three to five weeks after injury and is the procedure of choice when conditions are not right for primary repair. Secondary repair requires also a clean wound, soft tissues, a satisfactory skin covering over the operative area, and movable joints. Reliance is placed on good surgery and good surgical judgment rather than drugs to obtain primary healing. The proper splinting for a sufficient period of time is necessary to obtain strong union, and to protect paralyzed muscles from over-stretching and irreparable damage.

Psychoneurosis—Its Impact on Industry

—Are Psychoneurotics Employable?—

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THE Long Island College of Medicine and the committee in charge of this course are to be congratulated on their far-sightedness in including these discussions on "Problems of Post-War Industrial Reconversion and Personal Relationships in Industry." Although my experience in industry has been brief, I have been greatly impressed with the importance of good human relations for success in industrial medicine.

The term "psychoneurosis" has become quite popular in the past few years. One day a few years ago some ladies at a bridge party were discussing one of their number who was absent. One said "I hear Mrs. Plushbottom had a nervous breakdown." Her partner replied, "No, I understand she has enough money to have a psychoneurosis." But today psychoneurosis has become much less expensive—even private Joe Doaks has one. So does Bill Zilch, who was classified 4F by the Induction Center. Bill had mixed feelings when he learned of his classification. He would have been glad to go into service, but, on the other hand he wasn't sure how he'd be able to take it—and too there were a lot of things he could do if he could stay home. And Bill's employer was very glad when he found he could keep one of his best workers.

Joe, on the other hand, was resentful for being discharged—he wanted to stay in the service and prove he could "take it." And now he's worried because he's afraid that if he tells a prospective employer the real reason why he was discharged, he won't get a job. Or, if he got a job by keeping the matter secret, the stigma will always be over his head.

Why are employers afraid to hire men who have been labeled "psychoneurotic?" The big reason, it seems to me, is that we're all afraid of anything we don't understand. And, too, some of the ex-servicemen have had real difficulty in readjusting—but they are only a small percentage of all those discharged for neuropsychiatric reasons. Thousands of their comrades are making good in all sorts of jobs. Take one of our men: He had a really bad nervous break while a flight mechanic in the Marines under heavy combat conditions in the South Pacific. The next thing he remembers is being in the hospital at San Diego. He received metrazol shock therapy and eventually made a recovery. When first hired he was placed in a rivetting job. That was before our veterans program got under way. But the rivetting was too much like machine guns. He was unable to carry the job. However, we transferred him to the airport as a flight mechanic (where he should have been placed when he was hired) and kept him under occasional observation. He made good—in fact did so well that he was promoted to crew chief. He was married last January and now has his own home. I continue to see him occasionally and he is doing well.

The point, of course, is that with proper job placement and a little understanding on the part of supervision most of these people make good workers. Dr. L. E. Himler, consulting psychiatrist at the Detroit Transmission Division, General Motors Corporation, reports[1] that in Wayne County, Michigan, of a group

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of 300 men rejected at the induction station, slightly over 50% were disqualified for neuropsychiatric reasons. *But* about 88% of the 300 were employed at the time of examination.

Now who are these psychoneurotics? Generally speaking neuropsychiatric disabilities are subdivided into two general groups (Chart I): First, those in which definite structural damage to the nervous system can be demonstrated and second, those in which this is not possible.

The first group are distinguished as the "organic" and the second as the "functional" group. The functional group is further subdivided into two main categories: the minor personality disorders, the great bulk of which are the psychoneurotics, and the major personality disorders, or psychoses. Most psychoses require custodial care. With the popularization of the term "psychoneurosis," its meaning has been loosely spread to include all functional personality disorders.

CHART I.
CLASSIFICATION OF NEUROPSYCHIATRIC DISORDERS

FUNCTIONAL DISORDERS (Without Definite Structural Damage)	ORGANIC DISORDERS (With Structural Damage to Nervous System)
1. Minor Disorders	Infections
Psychoneurosis	Tumors
Psychopathic personality	Degenerative processes
Etc.	Etc.
2. Major Disorders	
Psychoses	

Now all of us are potentially capable of developing a functional personality disorder. All of us at times experience the symptoms. Anger, rage, fear, worry and frustration all produce symptoms similar to those experienced by the psychoneurotic. The difference lies in the degree to which one's life is affected. When family adjustment, social life and work are affected seriously, one is on the border of mental illness.

Why is the number of these disorders on the increase? We are all aware of the great strains that our men have to withstand in military service. There are also increasing strains on the home front—brought about by the breakdown in moral standards. Symptomatic of this are the increase in juvenile delinquency, the upswing in the divorce rate, the agitation for class hatred, racial friction, conflict between labor and management and the growing battle for control within the ranks of labor itself. The trend is toward national division and confusion. As a result of all this we have increasing tensions, insecurity and disillusionment. it's a vicious circle. No wonder the incidence of functional disorders is on the increase!

A consideration of these facts leads us to the conclusion that it is now doubly important that we have the facilities and the ability for aiding people with functional disorders in our industries. Obviously the

CHART II.
"PHEWSO" INTERVIEW FORM

FACTOR	RATING 7	6	5	4	3	2	1	COMMENTS
Personality "P"								
Health "H"								
Education "E"								
Work Experience "W"								
Social Background "S"								
Overall Rating "O"								

Recommend Reject Interviewed by_____

Job Recommendation_____ Date_____

CHART III.
EMPLOYMENT QUESTIONNAIRE

Work Experience

List all jobs held during past 10 years or more. If unemployed for a while, list the period of unemployment. List the most recent job first.

Company Name City and State	From Mo. Yr.	To Mo. Yr.	Total Time in Months	Occupation	Reasons for Leaving

Do you Prefer to work by yourself? Yes No
Do you get along well with those with whom you work? Yes No

CHART IV.

Education

At what age did you enter first grade?_____
At what age did you leave school?_____ At what grade?_____ Why?_____

How many times did you have to repeat grades?_____ Times
Were there any teachers with whom you could not get along? Yes No How many teachers?_____ Why?_____

Military Experience

If you were classified 4F by Selective Service, why were you so classified?

If you were in the Armed Forces, why did you join them? (Check one)
Drafted
Enlisted: Check one
For adventure
To get away from home
Patriotic reasons
Dissatisfied with job
Other (state what)_____

Why were you released from service?_____

CHART V.

1. How old were you when you could walk?_____
2. Do you have frequent headaches? Yes No
3. Are you upset by lightning or thunder? Yes No
4. Did you ever have a concussion (were you knocked out?) Yes No
5. Are you uncomfortable in a closed room? Yes No
6. Are you afraid when in high places? Yes No
7. Are you uncomfortable when in crowds? Yes No
8. Have you walked in your sleep since childhood? Yes No
9. Have you had nightmares since childhood? Yes No
10. Have you ever had fainting attacks, dizzy spells, or blackouts? Yes No
11. How old were you when you stopped biting your nails?_____
12. Are you afraid of the dark? Yes No
13. Did you ever have a nervous breakdown? Yes No
14. How old were you when you stopped wetting the bed?_____
15. Has any relative had high blood pressure? Yes No
16. Has any relative ever had a nervous breakdown? Yes No
17. Did any relative ever have cancer? Yes No
18. Are most of your relatives "difficult"? Yes No
19. Do you avoid unpleasant subjects whenever possible? Yes No
20. Have you ever been divorced? Yes No How many times?_____
21. Have you ever been separated? Yes No How many times?_____
22. If you have children, are they easily managed? Yes No

CHART VI.

Observations by Interviewer

Stammering or stuttering_____
Nail biting (or evidence—nails)_____
Blushing or very pale_____
Excessive sweating_____
Noticeable tremor of hands, etc._____
Attitude (cooperative or otherwise)_____
Ties or mannerisms_____
Appearance (Neat, careless, drab, colorful, etc.)_____
Mood (Blue, gay, colorless, etc.)_____
Intelligence (Quick, average, dull or retarded)_____

first essential is to be able *to single out those who are likely to need help before they are hired.* A good deal of work has been done on this problem. Dr. Harvey Bartle,[2] medical director of the Pennsylvania Railroad, has for some time trained his staff to include "personality data" as a regular part of their pre-employment examination. The personnel department of Detroit Transmission Division, General Motors Corporation[3] has worked out a simple form, the "Phewso" which gives a numerical formula as a rough description of a personality. (See Chart 2) Each of the six phases—Personality, Health, Etc., is graded—7 is the best and 1 poorest. The "Phewso" is useful at any time during an employee's career in the organization—and can be rated from time to time to show any changes.

We have been using a rather simple form as a rough screening device in pre-employment work. This contains A. (Chart 3) The Work History, B. (Chart 4) Education record, C. (Chart 4) Experience in military service, if any, D. (Chart 5) A series of questions designed to bring out neurotic characteristics and evidence of maladjustment in home and social relations, E. (Chart 6) A list of the interviewer's observations, such as excessive flushing, tremor, stammering, etc., and F. (Chart 6) a general summary and recommendations.

Summary and Recommendations:

THE aim of such a method is simply to single out those who will need special attention in job placement—probably not more than approximately 2 to 3% of those who are interviewed. These cases can then be given more extensive examination in an effort to determine whether or not they are fit to fill some one of the jobs available. In most firms at least a few will have to be rejected. If hired, it may be wise *to interview these people later at intervals so as to aid in their adjustment.* Often in this way one can spot symptoms early enough in the course of employment to deal adequately with them before serious trouble develops. As part of this follow-up work, it is important to enlist the aid of nursing staff, personnel, supervision, exit interviewers, and others. It is valuable to provide training for these groups in the fundamentals of industrial human relations. Thus we can increase the teamwork of all concerned. An illustration of what can be done is the following:

The other day I interviewed a girl who was employed in the sewing room. We had previously known her as a shy, sensitive girl of foreign education with language handicap and a tendency to emotional instability. Recently she was transferred to a different shift and had to work with a new group of girls. Her foreman reported that she was upset nervously and that her work was less efficient. I interviewed her the other day. Helen was obviously under a good deal of tension and shed some tears. She admitted that she did not feel at home with the new shift. Having the opportunity to talk about her fears helped, and she left the office in a better frame of mind. I then discussed the situation with the foreman. He is a sensible, cooperative man and had received some basic training in mental health work which we had given to all foremen in connection with the plant training program. We told him she had had trouble previously on the other shift but had adjusted fairly well with help. We felt one reason for her present upset was having to adjust to the new shift. The foreman, we said, could be of very real help by understanding her situation and dealing with it accordingly. We also talked with the woman supervisor in Helen's department. She too is very cooperative and willingly accepted our advice that she get acquainted with Helen. She also planned to win the cooperation of the other girls in the group. This case illustrated a significant principle in this work: *Building teamwork* with workers, supervision, counsellors personnel, and others. These people can play a very important part both in diagnosis and treatment.

Obviously in order to help these people with personality difficulties we must *first gain their confidence.* To do this it is important to be honest about ourselves with them. Good advice is not enough. It is necessary to take the further step of identifying ourselves with them in their problems and of giving them the answer founded in our own experience. Recently our educational director referred a boy who was having difficulty with his work and was nervously upset. John was obviously depressed and "fed-up" with things. I told him about a time when in college I'd felt much the same; everything seemed to go wrong, and every objective seemed futile. An understanding friend helped me to be honest with him about everything I was feeling. Then together we took time to think of the causes and to find the first definite step I could take to put right certain wrong relationships in my family. The result was a fresh grip on life and a pattern for living which I use every day in my home and in my work. This won John's confidence so that he told me about his home situation, which actually lay at the root of his trouble. He left with fresh hope and the confidence that I cared for him and understood his problem.

Another necessity in helping these people is *that we be sincerely interested in them*—not just as interesting cases but as people—and that we let them know we are. A couple of weeks ago one of our executives came, complaining that he hadn't slept in four nights. My first impulse was to give him a sedative; it was a fairly busy day. However, I had a feeling that that wasn't what he needed—or wanted either. So we talked for over a half hour. It seemed that he had always been rather tense and high strung. He was very capable and had had a number of different jobs in the organization but had never really found his "'niche." He was getting fed up with his job and didn't know what to do. I told him something of my own experience and that I was sure that there was a best plan for every man's life. Furthermore that I'd be glad to help him find the plan for his life. He responded warmly and seemed more hopeful. A few days later se haid, "I've slept every night since our talk."

The trouble with most psychoneurotics is that their energies are to a considerable extent misdirected. Their creative powers tend to get bottled up inside and then escape in undesirable ways—in worry, resentment or demand, with accompanying bodily troubles, such as headaches, backaches, and digestive difficulties, or in over-indulgence in food, sex, alcohol, etc.—misdirected efforts at obtaining attention, appreciation or satisfaction. We have found the best way is to teach them *to find satisfaction through devoting their creative energies and abilities to building sound homes, teamwork in industry, and a united nation.*

About a year ago one of our former employees, who had been on military leave returned to the plant. Jack was first placed in a job in the plant. But the noise was too much for him—he'd been discharged from service because of a nervous condition, accompanied by a colitis. Serving in the camouflage engineers in North Africa one of his assignments was to clean up land mines, booby traps, etc. He saw a number of his buddies blown up, others seriously maimed. Not long after his reinstatement Jack was sent to the medical department by his foreman, who felt he was unsuited to his job. Jack was jittery and unhappy. We managed to

CHART I.

Visit	Date	Name	Badge Number	Ex-Serviceman	Initial	Recheck	Referred By: Self	Supervisor	Medical	Employment	Other	Complaint	Diagnosis	Disposition	Transferred	Released
1	9/17	J. Jones	37-4-120	.....	.....	X	....	.....	.....	.....	(R)	Indigestion	Functional nervousness	Psychotherapy	.....	.....
2	.....	P. Smith	Pl. Prot.	X	X	.....	....	X	.....	.....	.....	Incompetent	Pre-senile arterio-sclerosis	Try on Medical Rx, etc.	.....	.....
3	9/18	W. Quinn	Superv.	.....	X	.....	X	.....	.....	.....	.....	Feels blue	Symptomatic depression	Leave of absence	.....	.....
4	.....	M. Green	17-1-00	X	.....	X	....	.....	X	.....	.....	Job too noisy	Combat fatigue	Transferred to outdoor job	X	.....

arrange a transfer to the airport. This helped but he continued to have trouble with his nervous condition and colitis for quite a while. In fact he became quite discouraged. The big thing that helped him stick was his devotion to his wife and six months old daughter. Incidentally he has improved greatly and has been promoted to flight mechanic. His care for his family is the secret of his success.

Another ex-serviceman, a boy of 22, who saw no combat but was discharged from the army after three months service because of a back injury and personality difficulties, was placed in one of our fabrication departments. He complained about his back a good deal and was demanding, irritable and uncooperative. After putting up with him for some time his foreman referred Bob to us saying he was fed up with him. He also stated, however, that the boy did good work when "on the beam." I welcomed Bob to the office and we sat down and talked for a while. At first he was resistive but gradually we began to get acquainted. He came back for several visits over the succeeding weeks and I pieced together the following story: His mother had died at any early age and so he had built his life around his father. He had spent considerable time in an orphan home where he was beaten up pretty badly. As a result he developed a fear of the dark which had persisted ever since. When his father died several years ago, Bob was shattered. He shut himself up emotionally and became resentful toward life and moody, preferring his own company. Gradually he began to open up to me and accepted suggestions about cooperating with his foreman and fellow-workers. Then he began to become interested in other people, striking up some good friendships and joining his department ball-team. His fear of the dark diminished. When on his vacation he sent me a couple of postcards expressing real gratitude. His foreman and he are good friends and Ted, the foreman, says he'd like to have more men like him.

Summary

THE application of neuropsychiatric principles to the management of people with psychoneuroses and other disorders of the nervous system need not be complicated. It involves the employment of scientific objectivity and simple horse sense in dealing with personality problems and inter-personal relationships.

The majority of cases can be well handled by understanding supervisors, personnel workers, counsellors, labor relations workers and others with basic training in industrial mental health. Teamwork with the plant physician (and vice versa) is often valuable. In doubtful cases, as well as with the frankly psychotic, a psychiatrist should be consulted.

The best way to handle these people is to identify them at the time of hiring, place them in suitable jobs and follow through until they are well squared away. In order to understand and deal with these people effectively one needs to know one's own personality pattern and reactions.

Also it is important to be sincerely interested in them as people and not just cases. This means that we consider the man to be at least as important as the machine he operates. Industry is interested in producing quality in products. It is equally important to produce quality in people, for people are more important than products. This is really one of the basic principles on which our country was built: the integrity of the individual.

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There is appended further case material which presents our experience in greater detail.

Psychoneurosis in Industry

SO AS to get a cross-section picture of the people with functional disorders in the Linden Plant I've been keeping a ledger in which are entered certain data for every N. P. patient visit. The cases were not picked but were simply the ones that I, as a plant physician, saw in the course of a day's work. Naturally, having had some training in neuropsychiatry one is "on the look-out," so to speak, for such cases. But only a comparatively small percentage of the cases were referred or came to me consciously for psychiatric help. Therefore the series of cases represents about what the industrial physician encounters on the average.

Chart I shows how the ledger is set up. In the 10 weeks during which the record was kept there were 152 visits by 100 patients. Of the 100 patients, only 28% were women as compared to 35% in the plant population. This was due largely, I think, to the fact that we have hired a good many ex-servicemen with neuropsychiatric disabilities. We have been specially interested in these men; and so they constituted just over half of the male patients, a disproportionately high percentage.

CHART II.
REFERENCES

	Cases	*Percentage*
Observation visits	38	26%
Routine reinstatements	36	24
Self	35	23
Supervision	25	16
Exit interviewer	7	4
Discussed with supervision	6	3.7
Labor relations, safety, education	3	2.
Pre-employment	2	1.3

How much time did these cases take? About 25 minutes per visit on the average: varying from 10 minutes to an hour and a half. Usually the first visit was the longest. Subsequent ones were often only 15 or 20 minutes.

Chart 2 shows the References—it is of interest that

nearly one fourth of the total came of their own accord. Sixteen per cent were referred by supervision. A total of 28% were picked up on reinstatement or exit interview. The small number seen before employment was due to the fact that during this period we were hiring few people. In four of the visits listed, the patient was not seen that day but his case discussed with supervision.

CHART III.
DIAGNOSES

FUNCTIONAL GROUP
(Without definite neural tissue damage)

1. Minor Personality Disorders:

Psychoneuroses
- Anxiety-hysteria, neurasthenic, etc. (47)
- Traumatic (1)

Functional nervous disturbance (17)
(With organic disease)

Psychopathic personality (2)
Schizoid personality (2)
Unsuitable for military service (2)
Migraine (1)

Total W2

Combat fatigue (5)

2. Major Personality Disorders Psychoses:
- Recurrent mental depression (1)
- Acute psychotic episode (1)
- Narcolepsy (1)
- Chronic alcoholism (2)
- Traumatic psychosis (1)
- Post-concussion syndrome (6)

ORGANIC GROUP
(With neural tissue damage)
- Epilepsy (1)
- Mental deficiency (1)
- Pick's disease (?) (1)
(Presenile cerebral arterio-sclerotic changes)

Chart 3 lists the diagnoses. They are divided into two main groups, the functional (See previous definitions) and the organic. Outwardly a case in the first group may seem the same as one in the second, yet the second case is quite different for he has a brain tumor or syphilis of the brain, or some other form of structural brain damage. By far the largest subgroup on the chart are the psychoneuroses. From the phychoneurotics we have separated a heterogeneous group of cases, the "functional nervous disturbances": These cases are different in that they have definite organic disease, such as peptic ulcer, ulcerative colitis, coronary artery disease, various allergic conditions, etc. These cases are characterized by a sensitive, reactive nervous system, and it is safe to assume that this is one of the chief causes for their disease.

The term "psychopathic personality" covers a heterogeneous group of abnormal individuals who, although of normal intelligence, have marked defects of judgment, are unreliable in behavior, and do not profit from experience. Their abnormal character is hidden by a veneer of superficial attractiveness which frequently fools the unsuspecting.

The schizoid personality, on the other hand, is much less aggressive, is deeply self-preoccupied, day-dreams excessively, has few friends, and is commonly known as "a queer."

Under the Major Personality Disorders, or Psychoses, are two cases. The man suffering with the recurrent depression was a young foreman, who had had a similar illness about seven months previous. He complained of excessive irritability, felt "fed up" with the world and had no drive. He was unable to account for his "blues" and we were forced to ascribe them to an hereditary tendency. He lost about a month from work and recovered spontaneously.

The other psychosis occurred in a woman of middle age who had been under a good deal of emotional strain in connection with her daughter's approaching marriage. The patient disapproved strongly of the prospective bridegroom. Her husband on returning from work one day, found her in a state of mental confusion. At our advice she was kept home for several days and recovered rather quickly. When seen some time later she was doing well.

The group of cases titled "combat fatigue" fits somewhere between the major and minor disorders. While some of these ex-servicemen undoubtedly had a psychosis in service, they are not now psychotic and may never become so.

Now for the Organic Group: Epilepsy perhaps fits here best, although there is also reason to place it in the borderline group. Pick's disease is a condition occurring in middle-aged people quite similar to the degenerative brain changes normally occurring in older folks and leading ultimately to the "second childhood." These people tend to show definite personality changes, are irritable, forgetful, and head-strong. This, like all organic disorders, requires the services of a trained physician.

Mental deficiency reminds me of the story of the village half-wit. When he grew to maturity the village council decided that he should have a job in order to keep him out of mischief. They decided to give him the task of polishing the old brass cannon on the village green. So he set to work and made the cannon glisten. Soon folks began to come from miles around to see this sight and it was decided to charge a 10-cent admission fee. Business was booming when one day the half-wit handed his resignation to the council. They were quite taken aback. "Well, you see," he said, "I bought a cannon and am going into business for myself over in Milltown." He wasn't so dumb after all. And it's certainly true that mild to moderate mental defectives do a large share of the work of the nation.

We had quite a group of cases that are hard to place definitely in either category—the borderline group. This includes narcolepsy. An engineering supervisor told me about one of his men who could not seem to stay awake. He was a good conscientious fellow and seemed quite ashamed of falling asleep on the job. Examination was negative, except for a moderately low basal metabolic rate. We prescribed thyroid extract and benzedrine, which were of some help in his problem.

Chronic alcoholism sometimes produces permanent brain damage with marked personality changes—at this stage it really becomes an organic condition. Our case of traumatic psychosis was a boy of 20 who had been discharged from the army due to a speech impedi-

CHART IV.
PRESENTING COMPLAINT

Complaint by Supervision and others
- Persistent absenteeism
- Work unsatisfactory, unreliable
- Refused to work assigned
- Filed six grievances against foreman
- Made a hunting knife in shop

Complaint by the Patient

A. Job Conditions
- Can't tolerate shift work
- Fumes bother stomach
- Job too noisy
- Unable to do work

B. Domestic Conditions
- Unsuitable living quarters
- Husband trouble
- Wife went to California and is now broke

C. Physical Health
- Stomach trouble
- Fainting spells
- Hot and cold flashes
- Nervous exhaustion
- Insomnia
- Asthma
- Headaches, dizziness

D. Personality Difficulties
- Unhappy, nothing to live for
- Afraid of a nervous breakdown
- Persecution complex
- Afraid of my machine
- Feeling blue and irritable
- Impatient with my subordinates
- Drinking too much
- Impulses to climb and swing on the pipes.

ment. After working at the plant for nearly a year he sustained a minor bump on the head while on the job. A few hours later he complained of severe headache and shortly became completely uncontrollable, having to be held down by six men. He continued in a confused excited state for about a week, requiring constant restraint and losing control of his bladder and bowel. He abruptly "snapped out" of this about 10 days later after being moved to the State Mental hospital and has since become quite rational and cooperative. He had a few abnormalities of his brain waves as found on the electroencephalogram. It was felt that there was a causal relation between the mild head injury and his psychotic episode.

We have had many cases of "post-concussion syndrome," following head injuries. There seems to be no very consistent relationship between the severity of the injury and the intensity and duration of symptoms. Patients have headache, dizziness, sometimes vomiting, and usually emotional instability and irritability. Some cases last over six months. We have found best results, I think, from returning them to a light job as soon as possible, giving large doses of reassurance plus an analgesic and a mild sedative when indicated.

Chart 4 lists some of the more typical presenting complaints. While the complaint does not usually make the diagnosis for us, it often gives a useful clue. For instance, people who complain about job conditions most often fall into the psychoneurotic or the functional nervous disturbance group. The same holds true for complaints re physical health. On the other hand, when the supervisor complains, the likelihood of another diagnosis is greater—possibly psychopathic personality, or alcoholism, etc.

Summary

A SAMPLE of the cases with neuropsychiatric disorders seen by the industrial physician over a period of time suggests that he sees about what the average physician in practice sees. This probably represents a cross-section of the population, except that there is a somewhat high percentage of ex-servicemen in our series. With an interest in neuropsychiatry, one is on the look-out for these cases and is better able to spot them—and therefore to manage them properly.

Industrial Relations Values

—In Industrial Medicine—

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THE examination, the treatment or any other type of consultation with an applicant or an employee in industry calls for medical or surgical skill on the part of the plant physician. This professional skill, however, is not in itself sufficient to meet the needs of the situation because there is always a real or a potential industrial relations problem present. This paper aims to examine and evaluate these industrial relations problems in general terms.

The philosophies in this paper which are applicable to a medical department apply regardless of the plant organization and without regard to whom in the organization the plant physician or the medical director is administratively responsible. Functional autonomy in regard to the exercise of his license to practice medicine is a primary requisite for the industrial physician employed in industry. Should, however, he limit his activity to the area defined by his license, he is adopting an attitude of professional immaturity incompatible with the coming age of industrial medicine.

From the day the applicant for any job is sent to the physician for a pre-employment physical examination until he terminates, voluntarily, or at request, or because of age, sickness, injury or death, his emotional comfort as well as his physical well-being will be subject to influence by the medical department. We can use the pre-employment examination as an example.

Two standard pre-employment physical examination forms may be completed on the same individual, and their review will reveal no essential difference in the two sets of findings. For the purpose of evaluating the suitability for employment or of estimating the needs for special job placement, each may appear to be comparable in their adequacy. The mutual relationships between the applicant, the medical department, the employment department and the company as a whole, however, will bear no resemblance to each other. We have enumerated previously and at greater length our views on the pre-employment examination. Briefly, the physician should know the job requirements, and if practical, should carry out the examination on the plant premises. He should respect the applicant's feelings as though he were a private patient. He should only reject where the defect will not allow employment or a special placement is impossible. He should discuss with every applicant, whether accepted or rejected, any existing problem in order to assist him in its correction or to live with it as comfortably as possible if it is uncorrectable.

At this point may I caution against the perpetuation of many pre-employment practices which were inevitable during the war and in which many of us participated, consciously aware, I hope, of their undesirability. Prolonged waiting, challenging questions, lack of privacy, arbitrary rejection of applicants, indifference to an applicant's emotions or to his situation do not show on the physical examination form, but they are seeds, planted in an applicant's emotional makeup, which sprout and grow to the detriment of the firm's employee relations and of the general reputation of the employer as well as of the medical department itself. An adequate pre-employment physical examination not only satisfies the needs for which it was designed, but prepares the applicant emotionally for the next step in the hiring procedure.

Let us remember that the applicant does not view the pre-employment examination objectively as a routine stock-taking of his physique and we should not appear to view him as a piece of equipment on which we are taking inventory. Let us rather understand his emotions so that we may fairly evaluate him as a human being, and in recording our findings, remain conscious of the limitations of the printed form. Let us remember that the applicant is confronted with a proceeding strange to him, carried out by strangers in a strange environment and that he is worried because he is conscious that his entire future life will be influenced by the decisions reached.

It is when he is in this state that we have the opportunity, not only for the physical evaluation, but for an estimate of his emotional stability and his reaction to an emotional situation which may not be again duplicated in our experience with him. It is at this time that we can reassure the insecure, approve the adequate, and eliminate the psychopathic. The cost of the hernia which is accepted and becomes an employer liability can be, and is, calculated. The saving accom-

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plished by the rejection of a single psychopathic personality, for instance, cannot be calculated, but his destructive influence if he is employed will be obvious and tremendous. His resulting activities will extract a penalty varying from discomfort to suffering (always at the expense of others, never at his), and any incidental property damage will be more amenable to repair than the emotional wreckage left in the wake of the classic psychopathic tornado.

The pre-employment examination illustrates the two sets of values which exist in practically all other functions of industrial medical service; the tangible, calculable, and valuable, and the intangible, incalculable, and invaluable. The actual cost of medical service must be justified when it is reviewed by any management, and the estimated expenditures on any proposed medical service must be accompanied by an estimate of expected returns. The financial side of industrial medical service can be presented favorably, but unfortunately, the accompanying immeasurable values cannot be so simply presented. It is as though we are figuratively standing on the base of an inverted pyramid, attempting to convince an incredulous companion that we are on the ceiling of a solid block rather than on a shallow platform. Let us not hasten to the conclusion that the individual who lacks depth perception and who sees only the platform appearance of the pyramid need be an industrialist. Not all industrial physicians are realizing the hopes of the managements who employ them, and who are fully conscious of the intangible values of which we speak. It is when this depth perception is fully developed in both the management and the medical staff that the medical service is so well entrenched and so secure that the financial balance sheet becomes one of casual interest. Today, more and more managements realize the industrial relations value of medical services, and we as industrial physicians are being challenged to fully develop our potential capacities. The article by Howard Strong, of the Chamber of Commerce, U. S., entitled, "Industry and Medicine—What Each Expects of the Other," in the March issue of Industrial Medicine, is an articulate appeal for the industrial physician to explore with management the depths of their joint opportunities for better industrial health. The tangible side of industrial medicine is not alone sufficient for a full justification of its case.

When we view the curative care rendered in the medical department and the procession of patients with their variety of ailments, complaints, injuries and illnesses, the opportunities for medical service are presented in a kaleidoscopic array. Each patient presents, moreover, a potential industrial relations problem. Those who content themselves with the medical or surgical treatment of the lesion are content with being mechanics. Scientific treatment does fill the needs of the science of industrial medicine. We have recognized for years, however, that medicine is an "art and a science." Certainly industrial medicine is not a branch which has kept the science but lost the art, and it is not the coming of age of an ugly duckling which we have celebrated. Industrial medicine offers every opportunity to practice with both science and art, and it is the opportunity for art that recompenses the industrial physician for any limitations which he considers are placed upon his opportunity to practice in the science. Tyros in industry are likely to feel that the limitations of the dispensary frustrate them in their field because the job restrictions may keep them from the hospital surgery or the wards. Their belief is strengthened by the precepts of a few of our older colleagues who have never realized the implications of the plant physician's position.

Industrial medicine cannot be described as being at a crossroads today. The term "crossroads" describes two well marked paths or two well marked roads, either of which the traveler may choose to the exclusion of the other. If we study the road map of industrial medicine, we will find the old highways still clearly marked, but in a state of poor repair. We will also find detours and side roads and short cuts of which considerable use has been made during the war.

I do not think it is of too great concern that we find the detours and the short cuts conspicuous as long as we recognize their existence and face them as an inevitable by-product of the war. Personnel was short, both numerically and in experience, and patterns of hurried first aid were established because they met the irreducible minimum of the situation's requirements. It is only if we fail to recognize that the justification for a minimum service was temporary or fail to realize altogether the inadequacy of this type of service that we are in serious difficulty.

We had an increased rise in the demand for medical service in industry during the war and a decreased supply of experienced personnel. The experience gained by those who entered this field and who will remain in it will be of value as a foundation for an improved peace time medical program. Those who were in prewar industrial medicine and remained in it during the war are being reinforced by the return of their colleagues who entered the Service. Collectively they should seek the highway of broad, fair medical service in industry predicated upon industry's medical obligations to its employees and supplemented by those services which promote better health among its employees and which will deserve the support of industry for a long term.

The medical program in industry should be self-sufficient and not dependent upon the existence of a community crusade or the fanfare of official or non-official agencies with expendable funds which may be available only temporarily. Such programs which are of a community nature must be expected to wax and wane as community interests and community funds increase and decrease. When they are operating successfully, they may supplement the plant medical service to the benefit of all concerned. Plant medical policy, however, should not be so extended in times of prosperity that it suffers disintegration in periods of retrenchment. On occasions when this has happened there has been displayed an insecurity which deters the desirable type of physician from entering industrial medicine and an insecurity to the medical program which has not promoted good industrial relations among the employees when benefits once extended have been withdrawn. The industrial medical activity which assumes the responsibility of community health undertakes to carry a load which may finally cause collapse of the program. Not only have the industries then placed themselves in an awkward position, but they have left the community ill prepared to shoulder the burden from which it had been, apparently, relieved. Conversely, the community which assumes to carry health burdens which are properly the responsibility of industry is neither strengthening industrial medicine, nor its own fundamental position.

It is as though we were to study on our road map the parallel highways of our colleagues in other health activities and were to find that they, too, had developed short cuts and side roads, some of which led them into the main road of industrial medicine, and that there were no exists until they had travelled farther than is wise for their long term good, or for ours. I believe we might review this situation frankly and with

friendliness. Our objectives lie in the same general direction and we should travel for a considerable distance on multi-lane highways which we jointly share and maintain. The traffic lanes should become fewer in number as we progress and our various associates reach the end of our common territory and branch off on their own highway to reach their own destinations. The final stretch to our destination, which is a sound overall industrial medical program, should find us travelling in the company of our own fellows only, whom we meet collectively as the American Association of Industrial Physicians and Surgeons.

It is we on whom the responsibility rests for the tenets of industrial medicine in the future. It is we who must individually and collectively explore and cultivate the industrial relations values of our American Association and of our medical departments in order that the practice of our science may carry with it the benefits of our art. We will have gone a long way collectively when we as individuals develop in ourselves an understanding of our patient and the situation as he feels it. To do this we must consider ourselves primarily as physicians rather than consider ourselves as employees first and as physicians secondarily. One of the delights of practicing industrial medicine has been the willingness of the industries who have employed physicians to allow them to exercise intellectual honesty in their employee relations.

The private practitioner realizes the need for good personal relations for his patients for the sake of his own practice. The need for good relationships between the industrial physician and his patients seems to be less to those who carelessly assume that, since the practice is ready-made, it does not require such careful consideration. This philosophy is not only false, it is dangerous. The private patient may leave the private practitioner and go elsewhere. This may not be possible without considerable difficulty in the industrial plant. Since the choice of the patient is limited and no happy relationship can exist which is not mutually satisfactory, it is incumbent on the industrial physician to increase his efforts to make the patient comfortable in view of his limited ability to go elsewhere. The good industrial relations attitude is mandatory for the plant physician!

With this attitude of professional maturity fully developed, our opportunities for rendering service over and above the somatic treatment of injuries or illnesses are so numerous that they defy detailed enumeration. In the years during which the bewildered applicant grows into an equally bewildered but less eager candidate for pension, we are presented with these frequent opportunities for increasing his comfort while he is an employee. Situations at work, relationships with fellow employees or with supervisors, and the effects of problems in the home or in the community confront us daily. We can serve as friends at court for the employees with any physical or mental maladjustment and by preventive action, adjust many a situation before it has become so complicated that only a painful solution may be found.

Not always can pain, disability, or deformity be mastered by medical skill. As mechanics we are defeated, but the artist of medicine can paint the realities of life in colors which make it at least bearable in spite of pain, disability, or deformity.

The effect of a properly functioning medical department will be reflected in all other departments by the better adjustment of the physically disabled or the emotionally disturbed. Grievances will be reduced because of mutually satisfactory settlements being arrived at before the grievance stage is reached.

An adequate medical department will minimize lawsuits, which are usually unhappy affairs for both parties, by paying early and proper attention to the rights of those involved. The medical testimony produced in court may settle cases, and it is a comfort when in court to have the testimony in good order. The intelligent use of the same information, however, presented to the affected parties early in the chain of events may often result in a settlement less spectacular than the court hearing but of greater value to the patient and to the industrial community at large.

There is no practicing industrial physician whose patients are not affected by conditions entirely extraneous to his professional field, running from housing to transportation, from finances, to love affairs (unilateral, bilateral, or triangular), from rationed sugar to scarce electrical appliances, from jealousy of a fellow worker to day-nursery problems, from laundry difficulties to induced abortions. Any of these conditions may be among the factors which may lie behind the careless accident or the stomach ulcer. The bandage or the gastro-enterostomy are the expedients which assist the patient temporarily over the hump. It is the knowledge, and the understanding of the knowledge, as to what confronts the industrial employee in working and in living which constitutes the long-term help and the industrial relations value of the medical department in industry.

Psychologically Hazardous Occupations

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THE RECOGNITION of physically hazardous occupations was one of the cornerstones of Industrial Medicine. Once the existence of jobs and trades dangerous to the physical health of the individual had been firmly established, public opinion, as well as the interest of management and worker, got behind the development of medical services in industry.

The recognition of the fact that certain jobs may be psychologically hazardous has come much more slowly, at least as slowly as it has come in the general field of medicine.

But our growing knowledge of mental ill health and, in particular, of the psychoneuroses, the development of techniques for selecting personnel, the growth of personnel departments, and of industrial medical services themselves, is now resulting in our identifying some jobs that are psychologically damaging to the worker. How early we are in doing so can be seen from the scarcity of reference to psychologically hazardous occupations in any of the current texts upon industrial medicine and from the infrequent mention in any system of job analysis of the psychological characteristics of the job.

Work during the last seven years in acute psychiatric centres located in highly industrialized areas has brought under investigation a considerable number of individuals in whose breakdowns working conditions appear to have played an outstanding role. From this range of cases we have found it possible to identify five characteristics of jobs as being responsible for these breakdowns. It is important to emphasize the fact that it is not the specific job which we have identified but characteristics which may be common to several different kinds of jobs.

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1. *Jobs calling for intense utilization of a limited range of the individual's equipment:*

There are a considerable number of jobs, especially assembly line and inspection jobs, which call for the use of only a limited part of the behavioral equipment of the individual. The classical example used to be the railroad telegrapher who sat hour after hour using only one hand to transmit messages. The extent to which industry has limited the number and range of the worker's actions can be seen in contrasting the narrow range of activity involved in the work of inspecting pipe castings with that of the farmer who during his work day may plough, chop wood, cut back the hedges and engage in a great range of different kinds of activity. Psychologically hazardous jobs are rarely injurious because of one characteristic alone. The job outlined in Case I is no exception. For, while it clearly has the undesirable features of calling for intense and sustained effort through a limited range of the behavioral equipment of the individual, it also has the undesirable characteristic of being a fragmented job, a matter discussed below.

CASE I: Mr. J. F., aged 56, came to the Allan Memorial Institute in October, 1944, with complaints of increasing tension, tremor, jerkiness of movement, depression and loss of appetite which had increased steadily for the last 18 months and now prevented him from working. He gave the following story:

"I was feeling well at about the beginning of the war (1939). That was when we became so damn busy, 100 hours a week, including overtime. After one week of that we went on a 65 to 80 hour week. Before, we were working a 50-hour week. At first I took it pretty well, later on the help was so inexperienced that I felt that I had to do a lot of the work myself while the others would lay off a bit. I felt the goods were so much needed that I worked overtime. After six months I began working overtime.

"About 18 months ago I began to feel a pressing feeling at the top of my head; it's not continuous, it's worse if I blow my nose hard. I got a craving for stimulants, tobacco, liquor. I started drinking. I fought it but I didn't fight it successfully. I began to drink after work, I never drank during work. I kept away from cigarettes. I can't tell you why I got this craving. Then I became unable to sleep. I couldn't fall asleep; when I did fall asleep I'd wake up again.

"I'd just pick at my food. In the morning one boiled egg, a slice of bread, a cup of tea. One sandwich and a cup of tea at 10:00, and one sandwich and a cup of coffee at 3:00 and at 9:00 o'clock I'd sometimes gorge myself and at other times I wouldn't eat.

"When I'd wake up in the morning I'd feel dead tired. Whatever sleep I'd get was between 8:00 and 10:00 o'clock in the morning. The rest of the day I felt tired all the time. I'd get to work at 7:00 in the morning. MY JOB IS TO EXAMINE 10,000 PIPE FITTINGS A DAY TO SEE IF THE THREADS WERE SERVICEABLE OR IF THE CASTING WAS SERVICEABLE. I STOOD BETWEEN TWO OR THREE MEN WHO WERE DOING THE SAME THING, BUT I HAD TO WATCH THESE MEN AS WELL. ONE OF THEM PASSED DEFECTIVE MATERIAL AND I HAD TO TAKE THE RAP FOR IT. I STOOD IN ONE POSITION ALL DAY. IT WASN'T PERMISSIBLE TO SIT DOWN. I USED TO STAND ON ONE FOOT ALL DAY. WE GOT 15 MINUTES IN THE MORNING AND 15 MINUTES IN THE AFTERNOON. I DIDN'T STOP OTHERWISE, NEVER LOAFED. THESE MEN BESIDE ME TOOK THEIR TIME OFF. I DISCOURAGED TALKING BECAUSE YOU CAN'T WORK AND TALK AT THE SAME TIME; YOU GOT TO CONCENTRATE. DURING THE LAST TWO YEARS I HAVE HAD ONLY TWO WEEKS OFF FOR VACATION. WORK FINISHED AT 8:00 P.M. ON SATURDAY AND SUNDAY AT 4:00 P.M. THEN WE ONLY WORKED TWO SUNDAYS A MONTH; THAT WAS A BREAK FOR US. WE ONLY GOT HALF AN HOUR OFF FOR DINNER AND HALF AN HOUR FOR SUPPER, IF WE WORKED UNTIL 9:00. IF WE WORKED UNTIL 7:00 WE WORKED STRAIGHT THROUGH.

"The lighting in the plant is good; I use a 100-watt lamp, just above my head. I never noticed it was hot, but others have noticed it. The noise in the plant is terrible. The air is hot. Along side about 5 to 6 feet is a 100-gallon tank full of boiling soda water in which our fittings would be washed. My hands were always wet.

"I didn't have many friends to talk to; most of my conversation was made with the superintendents. I just had one friend with whom I used to come home at night. I was always a lone wolf."

Study of this man's personality showed him to have been a particularly conscientious, thorough worker, precise and reserved, with little capacity to express himself and to get things off his chest.

Despite many months of intense therapy in the Institute it proved impossible to establish him in any kind of work, and his symptoms remain, though their severity has abated. The reason for this failure is to be found primarily in the fact that he continued too long at his work after his symptoms had appeared. In this description is to be noted not only the long sustained high-speed and intensely limited range of the worker's activity, but also that his physical relation to the job was highly restricted. He couldn't sit down, he had to stand in one position all day. Further, the meal periods were obviously based upon the amount of time required to get a certain amount of food into the stomach; there was no concept of them as periods during which the worker could get his tensional level down. Finally the demands of the job were such that he felt he could not talk and at the same time maintain sufficient concentration on his work. This was a further serious factor since we now recognize talking as a valuable means of getting things off one's chest and thereby preventing the rise of tension.

2. *Fragmented Jobs:*

A second kind of hazardous occupation is the fragmented job. By this we mean a job which is, as it were, one of the remnants of an occupation which was at one time complete in itself. Taking a very simple example of this one can say that at one time the worker made a wheel barrow from start to finish. At the present time he may only make the ball bearings. This breakdown of the job has been carried out on the basis of what the machine can undertake. There has been no concern as to what the individual needs in the way of job satisfaction. Indeed the term actually is not ordinarily used in this sense at all.

This hazard of fragmentation is probably one of the most widespread at least in industrial occupations. At the same time it is one of the most difficult for which to find a remedy. For it is clear that many occupations, especially those in the assembly line category, consist simply in those parts of a process which the machine cannot yet take over. Since much of the high output of modern industry has been attained from this policy of breaking down a process into parts which can be dealt with by the machine and introducing workers as links to carry on what cannot be managed by mechanical means, it is clear that our road must be forward and not back. We cannot expect that there will be a return to a time when the job can be completed in the sense that a single worker will build a wheel barrow from beginning to end. Rather we have to go forward and attempt to answer some difficult questions—what

makes a job meaningful and psychologically satisfying to the worker, how far can a job be stripped of its meaningful characteristics without becoming harmful to the worker, can we develop a complete technique of job analysis whereby we can estimate the psychological characteristics of the job in addition to those aspects at present recorded such as the amount and frequency of lifting, the motor dexterity required, the humidity and the temperature.

As an illustration of the undesirable effects of the fragmented job we refer back to Case I, namely that in which the man's job consisted only in the inspection of pipe castings. These undesirable effects are also shown very clearly in Case II.

CASE II: P. R., a 52 year old woman, was referred under the Workmen's Compensation Act to the Department of Neurology and Psychiatry at the Albany Hospital in 1941. She was suffering from an odd tic-like rotation of the head towards her right shoulder. This only appeared when her hands were raised above her waist line, as, for instance, on reaching over the counter to pick up a package at the store or on driving her car. On enquiry it was found that her work consisted in passing paper cylinders through a machine which pasted bottoms on them, thus producing a bag.

Essentially her activities consisted in picking up a cylinder with her left hand, guiding it through the machine and picking up and piling the completed bag with her right hand. On average days she made 18,000 paper bags. Although this work was exceedingly monotonous and tended to make her tense and tightened up, she was able to go on for several years until her sense of occupational security was endangered by a new management and the prestige which she had hitherto enjoyed as the operator of the largest machine and the recipient of the largest pay check—$18.00 a week— was impaired by the employment of her daughter on the same work and at $1.00 a week more. These two things caused a loss of the vestigial satisfactions which had remained attached to this extremely fragmented job. She began to feel extremely tense, irritable and fatigued. Tremor of hands and head appeared and finally the severe and quite incapacitating tic described above set in and she came to us nine months later. Despite prolonged psychotherapy, practically no improvement was achieved and the patient remained at the end of a year and a half quite incapacitated for her former, or, indeed, for any kind of work.

3. *Jobs Failing to Require Full Participation of Worker:*

The third type of occupation which can be psychologically hazardous is one in which the work, while never permitting the man complete freedom or relaxation, does not demand his full attention. If this type of job is, in addition, monotonous, it has been reported from the Hawthorne studies that obsessive thinking is liable to appear. By obsessive thinking is meant an increased sensitivity which leads the worker to pick up grievances, to develop them, and, ultimately, to experience a growing degree of hostility and resentment against management. We have seen very few instances of this type. It is conceivable that the pressure of the war speed-up has tended to eliminate this type of occupation. It also seems possible that some confusion may have arisen with the fifth type of hazardous occupation, namely that carried on in undesirable settings.

4. *Tempo:*

Jobs which are carried on at a tempo at marked variance with natural speed of the worker and which are, at the same time, repetitious, are now known to be hazardous, at least to workers having certain personality qualities. Among these are those workers who are over-precise, conscientious, rigid in their requirements upon themselves. When such individuals are pressed continually beyond their natural tempo and forced to make compromises between their standards of performance and the amount of their performance, tensional anxiety states are apt to appear. The variation from the natural tempo of the worker may be in either direction but during wartime speed-up cases in which damage was done by jobs which run far below the worker's natural speed were few. An outstanding example of a high-speed repetitious job is afforded by Case III.

CASE III: J. R., a 26 year old girl, was admitted to Allan Memorial Institute in May, 1945, with the statement that for the last three months she had been suffering from increasing anxiety. This was accompanied by a considerable lack of confidence, depression and weeping spells. Her heart rate was rapid and at times she was very conscious of it.

Latterly she had been unable to continue her work which consisted in stamping a pattern on handkerchiefs. Though her employer had shown her quite an unusual degree of consideration and had permitted her to come to work on the days she felt she could and had allowed her to break off when she found it too upsetting, she had finally become quite unable to continue.

On further enquiry it was found that she was on piece work, that she had to keep her production above a certain level. The work required a considerable degree of precision in centering the design correctly, there was a great deal of monotony and sustained speed was necessary.

She worked in the same room with several other girls who were engaged in the same kind of work. It was generally agreed by both the employer and the girls that the work was so taxing because of the need for high speed together with great precision that it was apt to "get on your nerves." For this reason the girls were allowed every so often to close down their machines for a few minutes, get up and walk around and go to the rest room for a cigarette.

In this way most of the girls were able to carry on as, indeed, had the patient for several years, though they all tended to feel rather edgy and tense from time to time and especially at the end of the day's work. When to this was added preoccupation by the patient over a boy friend who had deserted her for another girl who lived, of all places, right next door to her, it became impossible to keep her tensional level within manageable limits. In consequence the above symptoms began to appear. After several months of combined psychotherapy and chemotherapy in the Institute she had recovered sufficiently to be discharged, but it was impossible to return her to the same kind of work.

5. *Hazardous Job Settings:*

This psychological hazard consists not so much in the characteristics of the job itself in the narrow sense of the word but in the characteristics of the job setting. Where the informal organization of the department or division in which the man works is unsatisfying, where there is considerable frustration, where face to face relations between the man and those who make major decisions concerning his welfare are lacking, then one may anticipate the appearance of psychological damage at least in some of the workers, this damage taking the form of a development of grievances, of

anxiety over his status and of various psychosomatic ailments. This is illustrated in Case IV.

CASE IV: This 39 year old linotype operator, S. R., was admitted to the Allan Memorial Institute in July, 1945, with the complaint that about a year ago he began to feel tense and could not eat well. At the onset of his illness he consulted his family physician who told him he had "heart trouble." He was made to rest for about three months, during which time he worried excessively about his heart. On re-examination he was told that there was nothing wrong with it. His symptoms, however, were still more accentuated and, not unnaturally, he began to feel that his physicians were missing the cause of his complaints. He began to have panic attacks, collapsed on the sidewalk on one occasion. Liver injections were started but the patient's symptoms progressed. He was not able to go out on the street alone. In January, 1945, his stomach was x-rayed and for the first time he was told that his condition was primarily nervous. In March, 1945, he attended a private psychiatrist and made sufficient headway to return to work in April but apparently attempted to take on a full load too soon, so that after a month symptoms returned and he had to stop work again.

On further investigation it was found that this industrious, rather insecure and dependent person had found adjustment to the disorganized work relations which existed in the place that he worked too difficult. During the six months period preceding his final breakdown he worked as linotype operator on two different newspapers. The work conditions which he found in the first newspaper, the Mars Inquirer, were apparently poorly organized, there was a shortage of staff, supervision was inadequate and the patient found himself continually interrupted in his exceedingly exacting work. Once his symptoms had appeared, the sustained tension called for by his occupation was sufficient to cause their progression although the work conditions on the second newspaper, the Saturn Clarion, were so much better. The following is the patient's account of the work conditions as he experienced them:

"When I was off sick they sent me from the Mars Inquirer to the Saturn Clarion. I've only worked for the Saturn Clarion for two or three months. I was working for the Mars Inquirer when I took sick.

"The main thing about it is 90 keys (work at Mars Inquirer). Conditions were a bugger, to tell you the truth. Mismanagement, hard time to get equipment—hard to get money out of them. For the sake of a few dollars they could have made everything easier for everyone. I worried about it even out of work. I dislike slipshod methods anyway. The management was very hard to get on with, always putting the pressure on you, never leaving you alone—more or less the foreman—not really the management.

"That is one thing that harms the worker—for the sake of a few dollars here and there—even workers who are interested in their work—it finally got me under. Every time we'd complain, they'd give us a few dollars to stay.

"Of course, with the Saturn Clarion it's not the same thing. They are wonderful to work for. You could really be happy there—as long as you do an honest day's work—no pressure there. The management's wonderful. They take the responsibility, not the worker.

"It's not the hardness of the work—the work physically was nothing; it was the concentration you had to put on it and the mismanagement. You were doing somebody else's job and the management didn't give a damn. I could never take the attitude of easy come, easy go—if I could I suppose I would have been all right.

"The thing that got me down was the way the place was run. You'd go home worrying because you'd know what it would be like the next day. Nobody else seemed to worry and I felt I was the only one worrying."

After intensive psychotherapy and chemotherapy over a period of three months in the Institute it was possible for him to make a supervised return to his job as linotype operator with the Saturn Clarion where he was still working satisfactorily six months later.

In concluding this discussion of the kinds of psychologically hazardous occupation, emphasis must be given to the fact that we are dealing with a double equation. We cannot understand the reactions of the worker if we look only at the jobs. We have got to look also at the personalities of the men who are engaged on the jobs. Just as some workers are more susceptible than others to the effects of high humidity or inadequate illumination, so certain individuals are more susceptible to the damaging effects of the hazardous occupations which I have outlined.

Prevention:

In discussing the preventive side of this problem stress must be laid on the very serious and persistent nature of the psychological damage which may be caused by the various job characteristics which have been described. As can be seen from the cases mentioned, many of the behavioral reactions are singularly persistent and singularly incapacitating. Illnesses of this kind, once established, must be reckoned not in terms of weeks—only too often it is in terms of years. There is no doubt that every day men and women leave industry in chronic or permanent psychological ill health and that the causation of this is to be found primarily in the nature of their occupation. These people crowd the out-patient departments of the hospitals and the waiting rooms of the general practitioners.

THREE major preventive measures can be suggested:

(a) A job analysis which should include a careful evaluation of the psychological characteristics of the job in terms, among others, of those mentioned above.

(b) Personnel selection which should include evaluation of the personality factors which we now know to render individuals especially liable to damage from psychologically hazardous jobs. This is not difficult.

(c) Close medical supervision. The term medical is used in its proper modern sense as designating someone who is trained to observe and examine not simply the pulse, the blood pressure and the weight, but the individual's behavior as well. This close medical supervision should be carried out particularly in the case of those individuals who are engaged in psychologically hazardous occupations. Many of these serious psychological illnesses, instances of which have already been given, can be terminated quite rapidly if they are detected within the first few days or first few weeks.

SUMMARY: As our knowledge of the importance of the human factor in the health of industrial workers increases, we are beginning to recognize that certain occupations carry special psychological health hazards and that these hazards are particularly serious for workers having certain types of personality.

We are still at the beginning of our knowledge concerning this field but we can already recognize that the breakdowns resulting from exposure to these psychologically hazardous occupations constitute serious losses both to the worker and to the industry. We can also recognize the fact that many of these breakdowns are preventable.

EMOTIONAL FIRST AID STATIONS IN INDUSTRY

On the Job

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INDUSTRIAL medicine has made great strides during the past 25 years. The magnitude and urgency of the present war have greatly accelerated its progress, as evidenced by a statement of Dr. Thomas Parran, Surgeon General of the United States, "Expansion of Industrial Hygiene service and Industrial Medicine during the war has been one of the most significant advances in public health. Preventive industrial medicine has been more widely applied during the past three years than at any other time in our history."

At this stage of your course of instruction in the field of industrial medicine, you have certainly already been told of the chief objectives of a good industrial medical program. At the risk of repetition, I would like to mention these objectives again.

A modern industrial medical program is geared to provide:

1. Proper placement of employees in industry according to physical demands of the job and the physical capacities of the applicant.
2. Proper protection of the employee to safeguard his health.
3. Proper treatment for illness and accidents which occur while on the job.

In discussing neuro-psychiatric problems in industry, there is no reason to deviate from these major objectives. The emotional and mental problems which arise should not be separated from the physical problems. We may therefore suggest an outline comparable in scope to the above objectives, but which places emphasis on mental health as follows:

1. Proper placement of employees in industry according to their emotional status.
2. Proper protection of employees' industrial emotional environment.
3. Recognition and proper handling of emotional and neuro-psychiatric disturbances which occur on the job.

It is obvious that there is no conflict between these objectives. On the contrary, they supplement one another.

Industrial medicine is concerned chiefly with maintaining health, whereas the regular practice of general medicine deals chiefly with disease. That is, all too frequently, the average citizen does not call the physician until he is ill. In order for the physician to maintain his recognized position in the industrial scheme he must adjust the scope of his program to include the various problems of mental health as well as physical. It is no longer feasible to refer to the employee who is poorly adjusted to his work as a "crack pot" and recommend his termination. The early recognition of trouble spots and intelligent management of such situations is his responsibility.

Industry recognizes that a well organized medical service produces a favorable effect on the efficiency and general morale of the employees. A survey conducted by the National Association of Manufacturers indicates that a well planned medical program produces a 45% reduction in accidents, 63% drop in occupational diseases, 30% less absenteeism and 27% reduction in labor turnover. The program which produces such results must provide service in its broadest sense. Health education is a cornerstone of preventive medicine. Such education must be directed toward mental as well as preventive medicine.

The above mentioned statistics are not surprising to those who are engaged in the field. That the specialty of industrial medicine is here to stay is an accepted premise. The future of this relatively new medical field will depend largely on the attitude of those individuals who are engaged in such a practice. The pattern which is being set fits nicely into the field of human relations in industry. Let us hope that the days of industrial physicians as "finger-wrappers" are over, and the newer, broader and more stimulating concept of this specialty has been firmly established.

Because of the intimate connection between mental health and industrial adjustment, I would like to point out a few of the places where the Medical Department can contribute in a positive way to better human relationship in industry.

Large industries, particularly, and smaller industries to a lesser degree, are faced with the problem of the employee's loss of identity and individuality. This is not surprising in an age of machine specialization and production-line manufacture. It is, however, most undesirable and every possible opportunity to defeat this tendency should be seized upon. The industrial nurse and the industrial physician should always maintain an attitude of cordiality and personal, individual attention to each patient. Regardless of the monotony of an endless line of patients, it is bad practice to use assembly-line techniques. In so far as is possible, one should remember the employees' names. The name should be used for file purposes and the department and file number. Every effort should be made to personalize the service given. This tends to encourage employees to bring their personal problems to the physician before they become insurmountable. It is good policy for the professional staff to remind themselves occasionally that they are strictly a *service organization*. As soon as they fail to render a service acceptable to the employee, they will cease to exist.

There is a trend in industrial relations today to think in broad terms of employee welfare. A comprehensive program so directed includes, in addition to the medical department, other functions which contribute to the health and welfare of the employee. The safety department, working in close harmony with the medical, concerns itself primarily with accident prevention. Employee services are made available to help in solving problems of transportation, housing, rationing, etc. In-plant feeding has a close relationship with concept of welfare. The contribution of good nutrition to the over-all picture has already been discussed in previous meetings. Insurance programs can and should be directed toward emergency sickness, accident and hospitalization, pension retirement benefits and group insurance, which provides low-cost protection for dependents in the case of sudden death. Each such service makes a contribution to the mental health of the employee, since each function assists in establishing security and satisfaction, two basic requirements for good mental adjustment.

There has been a very decided tendency in industry toward closer cooperation between labor and management. Industrial physicians should take advantage of any opportunity to make their services through labor-management committees more effective. Such com-

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mittees are already functioning with considerable success in the field of health education. It is well recognized that labor generally tends to be suspicious of projects sponsored by management alone, even though they are in the very best interests of the employees. That same project, sponsored by labor and management, is much more likely to succeed. For example, a tuberculosis survey and control program or an industrial program for control of venereal diseases is promoted *for* the employees. Certainly, then, it is logical to consult their representatives and ask for their endorsement before launching it. The assistance of labor in selling any health program is invaluable.

We are hearing considerable about the word "integration" these days, meaning the bringing together of the parts to make a complete whole. The problems of management are the problems of the employees and, conversely, the problems of the employees are the problems of management. The alert industrial physician can and should contribute to this process of integration. He occupies a somewhat unique position since he is accepted by the employees, and his advice is sought by management.

The role of psychiatry per se in industry has already been presented at a previous session. Since I am speaking from the point of view of a general industrial physician, it may not be entirely repetitious for me to discuss this subject from that point of view. What do we mean by Emotional First Aid Stations on the Job? Not every industry can have a trained psychiatrist on the staff, either full or part time. The supply of psychiatrists is not adequate to permit this and the budget for most industrial Medical Departments probably would not either. Frankly, such a set-up is hardly necessary under most circumstances.

It is possible to deal intelligently with the everyday mental abnormalities and emotional problems in a much simpler way. The industrial physician should strive toward the ideal that each physician should be his own psychiatrist. To screen out a large percentage of the industrial psychiatric problems does not require that the industrial physician have a specialist's training. Rather, his approach should be that of common sense and a real understanding of human nature. If he knows the practical aspects of psychiatry and possesses a sound medical background, he will fulfill this function admirably.

In addition to this, the doctor should train his nursing staff to recognize personality problems and refer them to him for further analysis. The armed services have adopted a practice from which industry can learn an important lesson. Officers and enlisted personnel, who are responsible for groups of men, are instructed in the early signs of mental crack-up so that they can recognize the impending case and refer it for proper treatment early. In connection with our Veteran Program, we are providing supervisory personnel with information which will help them in recognizing danger signals. In this way, they can assist the nurse and the physician.

There are various stages of the common cold. This simple respiratory infection is often a forerunner of pneumonia and other serious complications. It is important that the industrial physician recognize that mental disturbances also vary in degree and severity. The earlier they are detected and remedial measures instituted, the more likley a prompt and satisfactory result.

Let me illustrate this by a simple case history which has actually occurred. "Jane Doe," who operates a punch press, reported to the Medical Department for examination. Her history showed that she was fidgety, that she was not doing well on the job. She requested that she be given a leave of absence for medical reasons. A general physical check-up did not reveal any abnormal findings. During the course of the visit, however, the physician found that Jane was a student of music, that she had never previously worked, and the relatively uninteresting and repetitive job had become extremely distasteful. This, coupled, with the fact that her fiance had recently been sent over seas, seemed to account for most of the trouble. The foreman had been displeased with her work of late and he had been reprimanding her. This girl was on the verge of a mental crack-up, which was avoided by a two weeks' leave and a transfer to another type of work on her return, which provided more variety. This employee has since made an excellent adjustment and is doing a good job. The physician, who recognized this problem and offered the solution, which proved to be successful, was not a psychiatrist. He is a general medical doctor who was interested in the problem, who knew what the job involved and who was willing to listen. Common sense provided the answer.

Much has been written and more has been said regarding the problems which industry must face in handling the returning veteran. Great stress has been placed on the neuro-psychiatric casualties, who will return and who must be re-absorbed into industry. In passing, I would like to touch upon this subject briefly. First, we must remember that we have always had many such individuals gainfully employed in our industries. Most of them did well in civilian life. Their boiling point for crack-ups was, however, always relatively low. It is not surprising that larger numbers have fallen by the way-side when asked to leave their homes and loved ones and to adjust themselves to an entirely different type of life. There is no reason to presume that with proper management they will not re-adjust themselves to civilian life successfully.

Such a change back will require tolerance and skill on the part of industrial managements. Careful placement and re-assignment where necessary, will depend on the evaluation provided by the medical department. This can be arrived at by an analysis of physical assets, approximate intellectual level as measured by school records, specific skills and previous work experience of the individual, and the personality characteristics. The returning veteran should be measured by your estimate of his ability to make an industrial adjustment. A more precise evaluation of the emotional status in most instances is not necessary.

It has been estimated that 20% of all employees in peace time are borderline emotional cases. The increased pressure of war time demands, both in the plant and at home, have undoubtedly not improved this picture. Superimpose on this the returning veteran, who will require time for his adjustment from soldier to civilian and we have ample reason for urging that the general medical department establish emotional first aid stations. The following suggestions are directed toward means of accomplishing that goal. How can the average industrial physician approach the problem?

1. He can be a good listener. Frequently problems at home influence the work habits and efficiency of the employee. The therapeutic value of getting it "off the chest" is often considerable, and the "gripe" may be solved by this alone.

2. He can capitalize his opportunity to personalize his practice and show sincere interest in the problems which will appear.

3. He can exercise his function to advise management on general broad objectives.

4. He can recognize industrial trouble spots and by working closely with foremen and supervisors, advise on general employee problems.

5. He can spot the accident-prone.

6. He can train himself to recognize faulty placement and recommend transfers to fit the individual's mental and emotional assets.

7. He can recognize the grossly maladjusted or seriously mentally ill cases and see that they receive adequate off-the-premises care.

The relationship of the industrial physician to outside mental hospitals is most important. Where it is possible, an arrangement should be made with such a reputable institution for further care of the mentally sick. Such a close relationship can be most helpful. A summary of the industrial history is helpful to the outside psychiatrist. He, in turn, can send his recommendations directly to the industrial physician when the employee is ready to return to work.

It is timely to suggest that more attention be given the mental aspects of industrial health. To do so will serve to broaden the field of industrial medicine as a specialty. It will enhance the value of medical service to industry; and, by industry, I mean both employers and employees.

It is not unreasonable to ask the general physician to take on such a function. His success in handling a major number of the every-day problems can be assured if he is alert and if he uses common sense and tact. The old-fashioned country doctor has been using the principles of psychiatry since the day of Hippocrates.

Off the Job

—The Industrial Patient in the Hospital—

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THE opportunity of treating the average industrial psychiatric problem in the hospital has been a real experience in the psychiatry of the future, which to my mind is mental hygiene. Through the vision, foresight, and close cooperation of Dr. Giberson, psychiatrist of the Metropolitan Life Insurance Company, we have had the privilege of treating some 400 such patients over a period of the past 12 years.

In its initial stages the whole problem of institutionalizing psychiatric patients in industry was one which was beset with many difficulties. The first hurdle was that of making the patient realize that he or she needed hospitalization and working out a basis of mutual cooperation between the company psychiatrist and the hospital, so that such important matters as disability benefits to the patient's dependents could be arranged promptly. The clearing up of any personal outside problems of the patient so that he or she could enter the hospital with as few actual pressing problems was found important, as they could then find it possible to take advantage of the full hospitalization time allowed by the company plan.

Only about 2% of the cases admitted were frankly acutely psychotic, having had acute onset of psychosis either at work or at home. The great majority of the cases (practically 98%) were borderline cases who had shown various symptoms of emotional instability on the job. This type is of most concern and interest to us today. Preliminary to referral to the hospital the problems of this group had been sympathetically and skillfully approached by the company psychiatrist. In most of these cases it was found that in addition to work problems that many of these patients had definite basic home maladjustments which would not only have delayed recovery with home treatment, but in many cases would have made it well nigh impossible.

The first years of our experience with this new type of problem required considerable adaptation on the part of the entire staff and personnel who came in contact with this new type of patient. Probably the initial interview between patient and hospital physician, which usually includes extensive history taking and the signing of various formidable sounding application blanks, required more adaptation on the part of the staff than anything else, as we were dealing directly with people, who, although well prepared by the company psychiatrist and anxious for treatment themselves, would often easily be thrown into a complete anxiety state by any mention of many of the terms commonly used and described in psychiatric hospital history taking. We have found that, once entered in the hospital, with few days complete bed rest and mild sedation, the majority of such cases has a great start toward a successful adaptation to the future diversified convalescent hospital program, which I will outline briefly and generally. Later, during the initial rest period, such a patient is given a complete physical check-up and such laboratory and x-ray studies as may appear to be indicated. During this period, psycho-therapy is begun. Here again we have learned that a somewhat different approach must be followed. It has been found that, once assured that their innermost secrets will not be revealed to the "company," they will usually ventilate to the sympathetic physician. Such interviews are scheduled daily during the initial period where indicated and as often as indicated and desired during the convalescent period. The initial "rest period" varies in time from two days to a week, depending on the physical condition and on the depth of psychiatric illness. Subsequently the guest is introduced to a prescribed regime of regular hours of sleep, eating, outdoor and indoor exercise and diversion. Regular occupational therapy is available, but it is not popular with this type of patient. They prefer indoor and outdoor athletics and social events. We learned that the program should be varied with occasional excursions to theaters, shopping trips and picnics off the hospital grounds. Such recreations provide an apparently much needed break for some, and are actual therapy for others who have to be guarded from becoming too fond of the protected atmosphere of the hospital. Usually after three or four weeks these patients are allowed to go home for a day's visit, if they so desire. Here it is interesting to note that they are usually, at first, anxious to return to the hospital at the end of the day. This apparent feeling of insecurity usually becomes less marked after a visit or so. It is also interesting to note that near the end of the hospital period, in about 90% of the girls and occasionally with the men, a definite and complete relapse has been noted. During this phase there is a return of all the initial symptoms and anxieties, sometimes with additional symptoms. A resumption of psychotherapy usually clears up this "last week-itis" rather promptly.

The company psychiatrist works in very close cooperation with the hospital staff and usually visits the patients every week or 10 days. The patients are always made to feel that they are free to contact their company psychiatrist whenever they feel the need to do so. A general medical and psychiatric report is made at the time of discharge, which goes into the patient's general medical records. In some cases recommenda-

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tions as to living conditions and environment of the patients, change of actual duties and department, are suggested by the hospital staff to the company psychiatrist, who in turn works out the adjustment through the medium of trained company nursing personnel and Director of Personnel, as the case may be.

Our statistics show that a great percentage of these psychoneuroses have been improved and have done very well at work over a period of years after hospitalization. About 25% of the psychoneuroses who were not expected to do well, from their hospital records, returned to work and did well.

About half of the schizophrenics were returned to work, but a check has shown that about 90% of these presented subsequent psychiatric troubles in the companies.

A particularly good example of a case of psychoneuroses, which appears to be on a reactive basis is that of Miss G. G. who had been with her company for 10 years in a clerical capacity previous to her first admission to the hospital in 1936. She had had a good work and attendance record up to six months previous to admission, when she began to have profuse sweating, attacks of nausea, general weakness and feelings of panic. She could not sleep and was highly emotional. She continued to work, but the quantity and quality of her work was markedly affected. She came under the care of the company psychiatrist who arranged for her admission to the hospital. She was physically negative except that she showed some gross tremors and vasomotor instability. We found out that she had been having symptoms as described since about six months after her mother's marriage to her step-father of whom she disapproved. After the usual regime and some psycho-therapy, she made a marked improvement in about six weeks. With the cooperation of the company, a congenial home was found for her. She returned to work and did well for over three years. She then had a second attack precipitated this time by financial troubles of her mother and step-father. She again recovered and again worked well for over three years. Then she had a third recurrence, from which she again recovered. She has been back at work now for over a year and has recently married.

A second illustrative case was Mr. C., who had had a responsible position for 17 years. In the year previous to his admission, his attendance record suddenly became irregular. The quality of his work was inferior and the relations with his superiors and those who worked under him were extremely strained. The company psychiatrist found that he had incurred a considerable, and what was to him, insurmountable financial indebtedness. He had secured funds to reduce his debt through loans from various finance companies, and had used the medium of trying to "beat the ponies" to pay back the loan companies. This attempt, in accordance with the usual history of such undertakings, had only resulted in his becoming more involved in debt than ever, and making himself the actual prey of bookmakers to whom he had become indebted. This set of conditions having accumulated, he allowed himself to take refuge in alcoholism, so that the company psychiatrist found that the patient was apprehensive, tremorous, irritable, and that he showed inability to concentrate and was utterly unfit to do his work. Hospitalization was suggested to the patient, who accepted the idea enthusiastically. After about a week's treatment, he made a marked physical and mental improvement, and was able during the remainder of his convalescent period to work out, through the aid of the company's legal department, a satisfactory solution to his economic problems. He returned to work in good physical and mental condition and has in the past three years done excellent work and completely liquidated his debt. He has earned two promotions during this period.

One of the best illustrations of an active psychotic in a war time industry is that of Mr. R., referred to us by the psychiatrist of a large war industry. This patient was a highly skilled tool and die worker, and was considered to be one of the most valuable men in his special field in the company. The first difficulty the company had with him was that his fellow workers found he was stealing their tools. He became highly excited when accused of the theft, and it was apparent that he needed psychiatric attention. The company psychiatrist discovered, after not too lengthy an interview, that this man was a paranoid schizophrenic of long standing. The patient entered the hospital and improved remarkably in four weeks after a course of electric shock treatments. He returned to work and was considered valuable as he was able to teach new employees quite successfully the intricacies of the tool and die trade. His remission lasted for a period of 18 months, during which time he was able to make a very good adjustment to the duties he was called upon to do. He again became suddenly psychotic the week after he was ordered to begin teaching female workers and has been extremely psychotic for the last four months, and he now continues under treatment in another hospital.

All in all the group has presented a most interesting and challenging problem which we are proud to feel has been met in a way which has proved fairly satisfactory to the industrial groups who have had the foresight and temerity to pioneer the treatment of their psychiatric problems by hospitalization.

Etiology of Dental Sequelae

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FOR MANY years it has been the custom of the medical and dental professions to assert and believe that dental sepsis is one of the most common sources of many subacute and chronic systemic diseases. A quarter of a century ago, for example, the Mayos asserted that in the majority of instances, chronic recurring diseases of middle age are preventable conditions due to mouth infection. About the same time, in 1925 or a little before, Irons, in an analysis of 329 cases exhibting various types of systemic diseases secondary to foci of infection, found that the incidence of aveolar abscess was preponderant over other localized infections, ranging from 23% to 65%, being highest in the arthritic group, a disease of middle life. Tice also demonstrated in a study of 50 cases of chronic arthritis an etiologic dental focus in 70% of the individuals, all of whom were well advanced in years. Similarly, Irons, Brown and Wadler found dental foci in 18% of iritis cases and that it was the only demonstrable focus in 7% of the individuals. This relative incidence indicates, according to Tice, that in the more chronic systemic infections of middle life the prevalence of dental foci is high, while in the more acute conditions of early life, it is low.

In subsequent years, there have been from time to time excellent presentations in the literature, citing instances of the occurrence of systemic lesions that might result from dental sepsis, comparing these with controlled individuals in whom dental sepsis did not

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exist. However, it has seemed to the author that the conclusions were presumptive rather than definitely etiological.

Tice has also emphasized some years ago that both the clinical and laboratory evidence at hand is sufficiently definite to permit the consideration of many acute localized infectious processes as being due to hematogenous metastasis from a primary focalized infection. He has stated, however, that the possible *remote* effects of persistent focalized infections are not so easily recognized. This distinction is important. In addition to this, Tice has stated that the most common and most difficult to recognize in their etiologic relation to a chronic focus of infection are those conditions which arise as a result of persistent feeding from a focus of infection, involving an organism of such low virulence that symptoms of tissue reaction are lacking, the primary evidence of the disease condition being the result of disturbed function, either local or general. Here again is a distinction which should be emphasized.

Later authors have admitted that assertions of the widespread effects of mouth infections apparently seem to be fantastic. Other statements, however, are to the effect that disease of any organ or tissue can be caused by mouth infection, which is the other extreme point of view.

With these points of view should also be considered the statement of Professor A. J. Carlson, Professor Emeritus of Physiology of the University of Chicago, as quoted by Thomas: "It is nevertheless a fact that modern medicine has not yet developed diagnostic methods to detect the beginning of injury to, and depletion of, the great reserves in the human body . . . the body may be seriously damaged without the individual himself aware of it in the sense of pain or weakness, but also without the ablest of physicians at present being able to ascertain the same with certainty." This quotation was published as late as 1942.

In the latest edition (1944) of Osler's Textbook on The Principles and Practice of Medicine (now edited by Dr. Henry A. Christian of Boston), the statement is made that "a local focus of infection may be the source of acute septicemia, but in addition, a variety of chronic infections may arise with distant and important manifestations. The resulting infection may be either local or general. The finding of focal infection may give the clue to the etiology of many obscure conditions. The earlier belief in the great frequency and importance of focal infection as an explanation of many subacute and chronic diseases now is on the wane; many are skeptical of this relationship except in relatively few patients; with this view, the present author is in agreement."

In another portion of the text, Christian says: "necrosed teeth, pyorrhea alveolaris, alveolar or apical abscesses and the like are present in many people. A systemic infection may follow, or the general health may be lowered by the continuous production of pus. In extensive pyorrhea alveolaris the daily amount of pus is considerable, and there can be no question that it influences the general health and is associated sometimes with a moderate anemia and a pasty complexion. . . . Severe anemia, myocarditis, endocarditis, nephritis, and forms of arthritis may be due to oral or dental infection. Possibly the main result of pyorrhea is to cause infection of the digestive tract, which may be followed by disturbances elsewhere. The most serious remote result from tooth infection is subacute bacterial endocarditis due to streptococcus viridans."

In further examining the evidence for and against the principle of the relationship between dental sepsis and systemic disease, Meakins in his book on "The Practice of Medicine" in 1944, stated that it is first necessary to point out that, although dental sepsis is a relatively common condition, all persons are not equally affected by it; second, that this does not, however, remove the possibility and probability even to a certainty in some instances that oral sepsis does eventually lead to readily recognizable clinical entities characterized by subacute and chronic systemic disease; third, that the reason why dental infection may produce injurious systemic reactions in some individuals and not in others remains an unsolved problem. Moreover, as the fourth point, systemic lesions apparently not only occur when the dental focus is quiescent, so far as can be ascertained, but such systemic reactions do occur subsequent to the trauma of dental removal.

Moreover, there is always the necessity of considering the relative virulence of the strain of bacteria involved, and the relative natural resistance and immunity of the individual with whom we are concerned. Since the early days of Ehrlich in his demonstration of the effects of toxins on the cells of various tissues and the principles of immunity, many have accepted and still do accept some of the old theories with respect to these relationships. Immunology is still a difficult and complicated subject, even for the professional bacteriologist and immunologist, and considerably more so for the clinician. Much work remains to be done in establishing specific relationships with respect to individual susceptibility, immunity and resistance, which always must be coupled, as has been indicated, with the relative virulence of the bacterial strains which are involved.

The whole subject, therefore, needs critical review and searching analysis and presents a problem in research. The problem involves both animal experimentation and clinical correlation, concerning specific relationships between various kinds of bacteria, the immunity and resistance of the individuals, and the production of specific subacute and chronic systemic lesions as sequelae. Furthermore, we are concerned, after the research is done as indicated, in the interpretation of the findings, which is probably the most difficult phase of the problem. Statistical analyses showing specific relationships need to be produced, based upon the existence and demonstration of specific cause and effect relationships. How much more intelligent it would be to be able to say to a patient: "With the type of infection you possess in your mouth, the chances are one in four that you will develop a chronic nephritis." Armed with such scientific knowledge, the dental clinician would feel that he was scientifically safe in his advice concerning the eradication of all septic dental foci and subsequent prophylaxis.

Because of the foregoing statements and facts, the author is proposing the formation of a medico-dental research institute for the purpose of correlating and demonstrating the part which dental sepsis plays in the production of subacute and chronic systemic diseases, with the study of auxiliary factors including other foci of infection (which must be ruled out if specificity is to be obtained concerning dental sepsis) and other subordinate factors which are important in this study, for example, nutrition and pulpless teeth. Associated with this, there should be critical analyses and a statistical array of the facts showing definite cause and effect relationships if we are to be provided with material which is sound.

Finally, nothing which has been previously said should be taken as an argument as against any and all efforts to clean up septic conditions in the mouths of all individuals who can be made available for this

purpose. Dental surgeons are accustomed to seeing industrial employees with extensive dental sepsis and realize all too well the necessity for ameliorating these conditions with all the facilities available, in spite of the fact that we do not possess at the present time what can be considered a critically evaluated body of sound specific knowledge regarding the relationship of dental sepsis to subacute and chronic systemic disease.

It may be well said in closing, that all the combined preventive efforts of the medical and dental professions will not result, in this generation at least, in causing a lack of clinical material for the adequate scientific study of the etiological relationships herein proposed.

Sunburn

—And Industrial Absenteeism—

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SOLAR burns, in their capacity as painful and disabling injuries, have been grossly underestimated by both the profession and the laity. Because of the relatively short period required for recovery and because these burns are mostly amenable to self-treatment, the physician is but occasionally consulted. Infrequent contact explains the mild interest displayed by the profession in the past. However, while excess solar irradiation usually results in not more than from one to three days of partial or total incapacitation, an appreciable number of burns do occur each summer which are of a more serious nature. These cases will evidence full-blown dermatologic and systemic pathology. Treatment of them will require definite medical aid or even hospitalization and will necessitate a week or more for recovery.

The present concern is not only with such severe cases, which are comparatively infrequent, but much more with the tremendous number of milder solar injuries occurring each summer. Concertedly, these burns are formidable in their economic aspects. Individually, a worker's efficiency may be impaired for several days, or he may be totally incapacitated for one or more days. A review of Monday and Tuesday absenteeism during June, July and August will amply bear out this statement. Normally, the loss in production incurred by a single one-day absentee multiplied by four or five million would be of considerable consequence. But today, with production schedules already a year behind, the loss of four or five million man-days of labor during the summer months is of deep concern to management.

Prevalence of Sunburn

ESTIMATES seem to indicate that about 60 million persons were employed in America during the war. Since there is but little unemployment apparent at this time, the above figure may be accepted as a rough approximation for today. At least half, or 30 million, of the above group, will indulge in some sort of outdoor activity during the warm months. The popular sports are those which will permit the maximum of exposure to sunlight, among which are boating, fishing, tennis, bathing or just lounging on a sandy beach. Of these 30 million sun-bathers, 50%, or 15 million, will indulge in irradiations far exceeding their safety tolerance. Obviously, such excesses will result in 15 million burns —ranging in degree from mild discomfort to hospitalization.

By virtue of actual field studies covering many years on the New Jersey and other beaches, the author feels confident in stating that of these 15 million actinic injuries, half, or seven and a half million, will be of sufficient severity to cause the loss of one day's work. The milder seven and a half million burns will produce distraction through peripheral pain or discomfort. Such is hardly compatible with the concentration and acuity required in countless industrial operations. The annual sale of many millions of dollars worth of remedies with which to treat sunburn strongly supports the above estimates.

From the foregoing it is readily appreciated that industry will lose about seven and a half million man-days, plus an indeterminate number of man-hours attributable to impaired efficiency, dislocation of schedules by absentees and desynchronization of plant operations. We shall witness this summer an immense number of solar burns—far greater than the past season. This prediction is based upon several influential factors.

The psychologic release and exhilaration precipitated by our recent victorious conclusion of the war has and will stimulate an unprecedented wave of pleasure hunting—not least among which are outdoor pursuits during the summer months. There is also an important economic factor. Lucrative employment during the past five years will enable many persons to indulge in extended summer vacations never before available to them. Normalization and expansion of transportation facilities will also encourage a wholesale rush to field, stream and beach. Ten years of professional and lay education relative to the healthful effects of sunlight have engendered an accumulative development as evidenced by the tremendous increase in the popularity of sunbathing within the past two or three years—and among these devotees will be found young and old, sick and well. In view of these facts it seems a certainty that this season will produce an unparalleled number of solar burns.

Sunburn Should be Prevented

LITERALLY, the sun is the fountainhead of all life. Any force of such infinite power must be treated with respect. The capacity of the solar spectrum for beneficence is equalled by its potential destructive powers. Loss of industrial time is but one of a number of reasons why sunburn should be avoided. More serious is dermatologic deterioration. Excessive and chronic insolation is etiologic in the producton of lesions which may be pre-cancerous—such as exaggerated freckles, eczema, hydroaestivales, keratosis, senilis, exeroderma pigmentosum, rosacea, lupus erythematous, vitiligo, warty growths and pruritis.

Prolonged exposure to intense sunlight, in time will cause the skin to become scaly, inelastic and thickened. It has been statistically proved that skin cancer incidence is far greater below the Mason-Dixon line than in the northern states. The inference here is obvious. Outdoor workers such as fishermen, farmers, sailors and others, soon show alterations in the integument of a pathologic nature. The biologic and chemical basis for these changes may be found in the radical efforts on the part of the defense mechanism of the skin to protect itself against excess radiant energy, primarily that of actinic wave lengths. These defense processes consist principally of proliferation, cornification and pigmentation, which, if excessively stimulated, eventuate into some sort of degenerative stage. Thus, points of greatest stimulation and consequently greatest response, are first to show neo-plastic changes. Cancer development is not only a sequel to an initial precancerous lesion, but is also the result of continued

trauma at this point—and the injury may be either mechanical, chemical or photo-biologic.

The dermatologic changes mentioned above, even in their mildest stages, are preceded by and accompany loss of "skin tone" or skin appeal. The epidermis has become blotched, rough, erythematous, thickened, aged and otherwise unattractive. A generally unrecognized phenomenon, frequently noticed by the writer, is that after severe solar burns, an inhibition or partial destruction of pigmentogenic processes takes place. This fact is signified by the failure of the skin to tan, not only during the summer in which the injury occurred but also for several or more succeeding summers. To the female, depreciation of skin appeal and inability to tan are distressing social handicaps. To the physician, they should be harbingers of impending or potential pathology.

Economic Loss

WHILE the economic phase of sunburn is not of direct concern to the physician, it is none the less of huge magnitude when viewed in total. The already mentioned absenteeism adds up to many millions of dollars. The employer must also be penalized by impaired efficiency, lowered output and disturbances in plant routine. The victims spend large sums for remedies with which to treat these burns.

Dermatologic deterioration, cosmetic impairment and economic loss are three major repercussions of sunburn. Individually or concertedly, these are of sufficient gravity to be accorded more respect as a medical problem than has been fact in the past.

Solar Burns

MILD burns provoke a hot, drawn, uncomfortable feeling in the skin, which is dry and erythematous. These symptoms will disappear in about 24 to 36 hours followed by the deposition of variable amounts of pigment. Severe burns are characterized by a high pain level of a peculiarly insufferable nature, which is further augmented by the slightest body articulation. Contact with bedding or clothing is unbearable. The integument is parched and a vivid erythema is present. Shock, chills, fever, nausea, tachycardia and a sense of impending dissolution—all may be attendant. This syndrome, more or less in its entirety, will persist for at least 48 hours. Toxemia and pain will now begin to subside. A "hard" edema of the ankles, face and legs or other parts of the body may now appear. A credible theory for this edema is the liberation of the vasodilator, histamine, which is synthesized as a degradation product of the altered proteins of the epidermis. Blister formation and desquamation are the concluding symptoms.

Treatment

THOSE cases serious enough to force the patient to seek medical aid are definitely a professional responsibility and must be treated as such. Relief of pain should be the first objective. A good anesthetic ointment, of which there are several excellent proprietary brands available, should be generously applied and covered with thick layers of gauze to prevent contact removal. Cod-liver oil ointment, carron oil and petrolatum are also helpful. Constitutional symptoms should be treated accordingly. Absolute rest will hasten recovery. Occasionally an intensely distressing pruritis may be noted which fails to yield to topical therapy. Ice compresses have been found to control such pruritis. Diet should be light, with a maximum of fluids.

Natural Defense

SOLAR energy between the wave-lengths of 2950 and 3150 Angstrom units is accountable for vitamin "D" formation, pigmentation and photo-dermatitis. While energy above these wave-lengths is of biologic value, the peak of activity resides in the quoted range.

The protective mechanism against excess ultra-violet light involves four functions: proliferation, or the stimulation of more cells; cornification of the surface cells; deposition of melanin or pigment in the basal cells; changes in skin cell proteins. The most effective erythemogenic and pigmentogenic wave lengths, i.e., those between 2905 and 3150 Angstrom units, are blocked by the cornified surface cells. The longer wave lengths, i.e., those above 3150 Angstrom units, are more penetrating and are not retarded until they reach the pigment situated in the basal cells next to the deepest skin layer. It seems therefore that provisions have been made for the absorption of different wave-lengths, possessing distinctly characteristic and different penetrative qualities, at different skin levels.

It may seem strange that man's shield against the outside world is apparently incompetent in defending itself from harmful effects when exposed to such an ubiquitous and benign influence as sunlight. Further reasoning proves the fault lies with man and not the design of his integument. Originally it was intended that man would spend an entire summer outdoors, during which his skin would become slowly and deeply pigmented and otherwise immune to excess insolation. These defense agencies would, because of their depth and quantity, be carried over the winter into the spring, when solar radiation again became potent. The immunity acquired the previous summer would be sufficient to prevent injury during initial exposures of the succeeding season. As the spring and summer continued, the entire cycle of acquiring and storing a "defense" for next year is repeated. Modern living has of course changed all this. The average person spends one or two weeks outdoors, and possibly several weekends. Such an annual irradiation is utterly insufficient time in which to build up enough immunity to carry over into the following year. Consequently, during the first few initial exposures, man presents to the sun an almost totally defenseless skin.

Prevention

THE average person who wishes to prevent solar dermatitis must avail himself of one of two possible alternatives: either restrict initial exposures to within safe tolerances for untanned skin, or use an effective sunburn preventive. Voluntary control has not and probably will not be practised by the general public. This is fact for two reasons: first, neither the physician nor the layman has, in the past, known what constitutes a safe irradiation, and, second, it is completely impossible for the lay person to associate the warm pleasurable sensation experienced during sunbathing, with potential danger.

And, even if cognizant of danger, many simply proceed to ignore it.

The three factors which govern cutaneous reactions to biologically active ultra-violet energy are: individual sensitivity, intensity of energy, and length of exposure.

It is clearly evident that these factors are not constants, but rather are variables which are subject to considerable change and fluctuation. Luckeish (Artificial Sunlight) very thoroughly evaluated the response of average untanned skin to sunlight which follows:

"Effects of June Sunlight at Noon on Average Untanned Skin"

20 minutes	Minimum perceptible erythema
50 minutes	Vivid erythema
100 minutes	Painful burn
200 minutes	Blistering burn

An erythema in itself is not an injury but is visual evidence that the skin has responded to ultra-violet stimulation.

However irradiation beyond this point exceeds the non-injurious tolerance for that particular skin and will result in a burn of varying degree, depending upon the total irradiation.

All recommendations for safe exposures for average untanned skin are based on the fact that the "vivid erythema" is the maximum non-injurious reaction. In general, therefore, 50 minutes, or "vivid erythema," is a safe initial exposure for the average person. Those possessing hypersensitive skin should be governed by their past experience and reduce their irradiations, using the above average as a guide. Blondes and red heads may vary from given tolerances by as much as 40 to 170% in hypersensitivity. In high altitudes, because of the clarity of the atmosphere, ultra-violet intensity far surpasses that existent at sea level. Under such conditions, safe exposures would be about half the recommendation given above. The same is also true near or over large bodies of water. Ultra-violet reflections from the surface of the water may augment the direct rays by as much as 100%. The ultra-violet content or erythemogenic potency of sunlight at two hours before or after noon is about one-third less than that of noon. Irradiations at such periods may therefore be substantially longer than at or near midday.

Preventives

AS HAS been stated, most persons simply cannot or will not associate the warmth and relaxation attending sunbathing as being of potential danger. Warnings relative to over-exposure are invariably disregarded. The use of an efficient sunburn preventive seems to be the only sure way of avoiding solar burns. These preparations may be in the form of creams, oils, or lotions. Their activity is dependent upon an ultra-violet screen or filter contained in solution or suspension.

The function of such screens is to retard erythemogenic energy to within such limits that over-exposures cannot take place.

Among the compounds employed for this purpose are tannic acid, esters of anthranilic acid, napthol sulphonates, quinine and derivatives, menthyl salicylate, phenyl salicylate, etc. These are gradually being abandoned because of either feeble screening qualities, or chemical instability in the presence of ultra-violet light, or because of dermatologic repercussions such as stinging and irritation. Esters of para-aminobenzoic acid have been found ideal for use in sunburn preventives.

Their absorption curve in the erythemogenic range is extremely high, they are stable when subject to ultra-violet influence and they are entirely innocuous dermatologically.

An efficient sunburn preventive should not permit the passage of more than 25% of the solar erythemogenic rays. Thus a person could be exposed four hours, or 40 minutes, but when protected by a product of the above efficiency, his skin would be subject to 25% of the total, or 60 minutes. This is slightly in excess of the previously made recommendation but body rotation in relation to the sun would prevent any surface from receiving the entire irradiation.

Summary

FIFTY minutes is the average safe exposure for untanned skin.

2. The public in general will not observe warnings to avoid over-exposure.

3. The use of an effective sunburn preventive is the only sure way to prevent solar burns.

The Ramazzini Society

THE RAMAZZINI Society will hold its first formal meeting beginning May 17, 1946. The spontaneous program, covering three days, will be featured by the Ramazzini Oration. This Society was established several years ago: "Physicians of the Americas engaged in occupational disease work and medical industrial hygiene have organized themselves into a Ramazzini Society with one objective, this being the sponsoring of an annual Ramazzini lecture for the purpose of honoring the memory and achievements of Bernardino Ramazzini, the patron saint of industrial medicine." (See INDUSTRIAL MEDICINE, 11:11, 529, November, 1942.)

The Ramazzini Society has 31 physician members; the only list of the membership ever published appears in "A Blind Hog's Acorns," by CAREY P. MCCORD, M.D. (Copyrighted, 1945, by the publishers, Cloud, Inc., Chicago).

Letters

TO THE EDITOR:

REFERRING to my article, "A New Dressing for Burns and Extensive Abrasions," in INDUSTRIAL MEDICINE (14: 10, 796-797, October, 1945) I want to advise that, since the article was published, I have made extensive investigations as to the preparation of a proper container for the medication to be used, and I find that E. I. du Pont De Nemours & Company, of Wilmington, Delaware, manufacture a perforated cellophane with one-32nd-inch holes on three-32nd-inch centers. This cellophane comes in strips and is admirably adapted for the application of any medication by simply smearing the medication on one side and then applying the perforated cellophane directly to the abraded or burned surface and covering the upper surface of the medication with a film of non-perforated cellophane. This obviates entirely the necessity for the use of envelopes and makes a much simpler dressing than the original one I had in mind when the article was written. I am greatly indebted to Mr. C. L. Blair, of the Technical Section Laboratory of the E. I. du Pont De Nemours Company, for the interest he has taken in selecting this perforated cellophane film, and it is my intention to call this film to the attention of the manufacturers of surgical dressings so that they could supply the perforated film and also the non-perforated film in sterile packages to physicians or surgeons who would desire to use this dressing. The new film, being pre-perforated, and with accurately-sized perforations, is ideal and is much simpler of application than the original envelope devised which required quite a little effort to fill. By using this pre-perforated film it is simply necessary to smear the desired amount of film required to cover a burn or abrasion with a requisite amount of the medication to be used and apply that directly to the injured surface and then cover the film of medication with a non-perforated film and apply a dressing, either a simple retaining bandage, or, if compression is desired, a compression bandage.

—GEORGE S. KING, M.D.,
Bay Shore, New York

Symposium on Industrial Health

—Western Association of Industrial Physicians and Surgeons, June 30, 1946—

SINCE California is now a great industrial state it is obligatory that the medical profession become informed of the latest developments in the field of industrial medicine. To meet this obligation, the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS will hold a one-day convention in San Francisco on June 30, 1946 (Sunday), which is the day immediately preceding the opening session of the American Medical Association in that city. The convention will be held in the San Francisco Health Department Auditorium, which is adjacent to the Civic Center where the A. M. A. will meet. This industrial health program will be the finest of its type ever to be held on the Pacific Coast. It is designed to cover the field of industrial trauma, the occupational diseases, and industrial hygiene, and should have a wide appeal to the general practitioner who, because of the war, has been engaged to some degree in this fast-developing field of medicine. The convention begins at 9:30 A.M. and continues through the day with two papers only in the evening, following the dinner. For further information write to RODNEY BEARD, M.D., 2330 Clay Street, San Francisco 15, secretary, or to the Program Chairman, RUTHERFORD T. JOHNSTONE, M.D., 727 West Seventh Street, Los Angeles 14.

Program

PRESIDENT'S Address—RICHARD O. SCHOFIELD, M.D., Sacramento, California.

"Evaluation of the Factors Tending Towards Permanent Occupational Deafness"—WALTER R. MACLAREN, M.D., ALBERT L. CHANEY, PH.D., Burbank, California.

"The Utilization of Aluminum in the Prevention and Treatment of Silicosis"—J. W. G. HANNON, M.D., Washington, Pennsylvania.

"Laboratory Procedures to which the Industrial Physicians should Resort for a Better Diagnosis"—W. C. DREESSEN, M.D., Bethesda.

"The Pneumoconioses — Their Differential Diagnosis and Prognosis"—O. A. SANDER, M.D., Milwaukee, Wisconsin.

"The Immediate versus the Delayed Repair of the Digital Tendons"—J. H. BOYES, M.D., Los Angeles, California.

"Treatment of Industrial Eye Injuries (Traumatic and Toxic)"—HEDWIG KUHN, M.D., Hammond, Indiana.

"Reconstruction of the Amputation Stump for Weight Bearing"—D. D. TOFFELMIER, M.D., Oakland, California.

"Placement of the Industrial Worker—A Symposium"—BERT HANMAN, chairman. Principal Speakers:

HENRY H. KESSLER, M.D., Member, Council on Industrial Health, Newark, New Jersey. (Industrial Medicine.)

EDWIN E. GHISELLI, PH.D., Professor of Industrial Psychology, University of California. (Industrial Psychology.)

KARL M. BOWMAN, M.D., Professor of Psychiatry, University of California Medical School. (Industrial Psychiatry.)

W. F. DURAND, D. ENG., Professor (Emeritus) of Mechanical Engineering, Stanford University. (Industrial Engineering.)

Experts:

F. W. HUNTER, Regional Director (12), U. S. Employment Service, U. S. Department of Labor. (Personnel.)

SCOTT B. HARRINGTON, Director of Vocational Rehabilitation and Education (12), Veterans Administration. (Rehabilitation.)

HARRY B. HICKER, Chief, Bureau of Vocational Rehabilitation, California State Department of Education. (Civilian Rehabilitation.)

FRANCIS B. QUINN, M.D., Regional Medical Officer (12), U. S. Civil Service Commission. (Government Employment.)

GEORGE S. ENNIS, Special Representative, Western Region, National Safety Council. (Industrial Safety.)

ROBERT T. LEGGE, M.D., Professor (Emeritus) of Hygiene, School of Public Health, University of California. (Workmen's Compensation.)

W. P. SHEPARD, M.D., Third Vice-President, Metropolitan Life Insurance Company, and Clinical Professor, Stanford Medical School. (Public Health-Education-Insurance.)

RODNEY R. BEARD, M.D., Medical Officer, Pan American Airways, and Assistant Professor, Stanford Medical School. (Industrial Hygiene.)

DAVID JENKINS, Executive Director, California Labor School. (Labor.)

W. G. STORIE, Executive Vice-President, San Francisco Employers Council. (Management.)

Dinner—Palace Hotel—7:00 P.M.

After Dinner Speakers—CLARENCE O. SAPPINGTON, M.D., Chicago, and ANTHONY J. LANZA, M.D., New York City.

DR. PILGRIM

AGAIN appearing before the Industrial Commission and finding appointments subject to change on short notice. . . . AND a meeting of the Chicago Section of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION and a panel on "Procedure in the Handling of an Occupational Disease Claim," with WARREN COOK, FRANK R. PEREGRINE, attorney; ALFRED J. BORAH, Chairman of the Industrial Commission of Illinois; and WILLIAM BOWE, attorney, wherein great interest was manifest in the answers by the members of the panel, of questions on hypothetical cases, one on alleged lead poisoning and the other on alleged silicosis, and speaking at this meeting on "Tuberculosis as a Compensation Problem"....AND conferring with DR. WILLIAM A. SAWYER anent the program of the Section on Preventive and Industrial Medicine and Public Health of the A.M.A. for the forthcoming July convention in San Francisco, and sitting at a luncheon with the members and guests of the A.M.A. Council on Industrial Health, including DRS. FISHBEIN, WEST, DRAPER, SELBY, SEEGER, LANZA, BRISTOL, BARTLE, PETERSON, SAWYER, KESSLER, KRONENBERG, and others. . . . AND much correspondence with "RED" JOHNSTONE and BERT HANMAN on the program and activities of the June 30 meeting of the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. . . . AND sojourning to Purdue University at Lafayette, Indiana, to talk on "Medical Testing," and again renewing friendships with the faculty of the Division of Applied Psychology and Education, among them PROFESSORS JOSEPH TIFFIN and EDGAR WIRT, meanwhile taking my courage in my hands and going through the Humm-Wadsworth Temperament Test, finding out many interesting things. . . . AND busy with transcripts of legal proceedings and notes on compensation cases, and lengthy reports with reference to surveys, and following as usual with the accompanying laboratory determinations....AND attending the Medical and Health sessions of the American Association for the Advancement of Science, in annual meeting at St. Louis, lunching with DRS. CARL PETERSON and WILLIAM MCCONNELL, and meeting PROFESSOR ANTON CARLSON, DR. COWDRY, and DRS. HUSSEY and CARLISLE, and having the pleasure of libations, dinner and the evening with alumnus associates CHARLES and DOROTHY RHEIN, and learning that they too, have suffered much from the last war. . . . AND at General Motors Club party at dinner, sitting with MESSRS. W. I. BUCHANAN, C. R. OSBORNE, DRS. CARL PETERSON, WARREN FUREY, F. H. MULLER, A. L. BROOKS, and MAJOR W. F. POWELL, the same preceding a medical showing of the new General Motors film "Doctor in Industry". . . . AND to Detroit on the Mercury for an afternoon conference with DRS. RAY HUSSEY, CLARENCE SELBY and E. A. IRVIN relative to courses on administrative medicine, and speaking at a dinner meeting of the Industrial Physicians Club of Detroit on "Some Significant Trends in Industrial Medicine," and next day talking for DR. RAY HUSSEY in his regular course on "Medical Administration in Industry," and enjoying converse with CAPT. BELL and DR. GRANT CUNNINGHAM, of Canada, DR. WILLIAM B. FULTON, and others, and later at luncheon with a group of Ramazzinians, with plans for a spring meeting. . . . AND from Detroit to an Ohio plant for several days to make a dust survey; and back in time to register at the Hotel Sherman for the combined meetings of the various professional industrial associations, physicians, hygienists, nurses, and dentists, these replete with new subjects, new faces, and extensive exhibits, and where other activities of the week included the Board of Governors meeting of the CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE AND SURGERY, dinner meeting of the Associate Editors of INDUSTRIAL MEDICINE, reading a paper before the dental group, participating in a panel regarding industrial nursing problems, and encountering many old and new friends, at breakfast, luncheon and dinner each day. . . . AND again to Cincinnati and conferring with plant officials regarding future plans and procedures in the medical department, and thence to eastern Kentucky on another plant survey, by automobile through what the creator of "Little Abner" calls the "Dogpatch Country," and enjoying dinner with MR. and MRS. JAMES GRAVES at the famous Brown Hotel at Louisville, and until train time having libations and music with my old friends, DR. PAUL and ALICE TURNER.... AND home to become busy with numerous conferences and plans for trips to Missouri, Illinois, Indiana and Michigan, of which in later notes. . . .

Left foreground: Dr. F. H. Muller, President, Chicago Medical Society. Left to right: Dr. W. W. Furey, Secretary, Chicago Medical Society; Dr. C. M. Peterson, Secretary, Council on Industrial Health, A.M.A.; Mr. W. I. Buchanan, Manager Chicago Branch, Frigidaire Sales Corporation and President, General Motors Club of Chicago; Dr. A. L. Brooks, Medical Director, Fisher Body Division, General Motors; Dr. C. O. Sappington, First Winner of the William S. Knudsen Award, American Association of Industrial Physicians and Surgeons; Mr. C. R. Osborn, Vice-President, General Motors and General Manager, Electro-Motive Division. Right foreground: Major W. F. Powell

"Kenneth W. Randall, M.D."

—Chicago Medical Preview—

PHYSICIANS and surgeons to the number of about 100 were guests of the General Motors Club of Chicago at a showing of the new General Motors film "Doctor in Industry," at the Palmer House, Chicago, March 29, 1946. The Jam Handy Organization's movie cameras having done such a fine bit of work in depicting the life story of "Kenneth W. Randall, M.D." in industrial medicine, the candid cameras essayed their contribution to the preview, whence the pictures here. This film was described last month (15: 4, 264-267, April, 1946). The formal premiere was at the Conference on Industrial Health at the Banquet of the five participating associations: the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES, the NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS, the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, and AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS.

(Left) Dr. M. T. MacEachern, President-Elect, Chicago Medical Society; (Right) Dr. F. H. Muller, President, Chicago Medical Society

Left to right: Mr. W. I. Buchanan, Manager Chicago Branch, Frigidaire Sales Corporation and President, General Motors Club of Chicago; Dr. J. H. Chivers, Medical Director, Crane Company and Chairman, Committee on Industrial Health, Illinois Medical Society; Dr. H. H. Steinberg; Dr. C. O. Sappington; and Russell Lesher, Zone Manager, Oldsmobile Division, General Motors

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"A Blind Hog's Acorns"

THE following is what DR. VICTOR G. HEISER, author of "An American Doctor's Odyssey," and consultant for the National Association of Manufacturers says about DR. MCCORD'S latest book: "All those who are curious about the marvels of modern preventive industrial medicine should read 'A Blind Hog's Acorns' by CAREY P. MCCORD, M.D., and even if they are not curious they should read it anyway. The idea that this subject is as dry as a bone, which some people seem to think, is completely refuted in this book. It has all the thrills of a good detective story and deals with an amazing number of experiences, with angles that have never been touched upon even by fiction writers. The best of it is that the author had no need to draw on his imagination. The experiences related are true, and again show the amazing protection which modern industry throws around its workers. Nothing could be more interesting than to be an invisible witness to the ingenious solutions of the many baffling problems confronting DR. MCCORD. I am sure the general public has no conception of the accomplishments of modern science in avoiding the hazards of working with products that during certain stages are most dangerous but that finally emerge as harmless articles which are used in our everyday lives. All this requires the resources of physics, chemistry, engineering, biology, as well as the arts of medicine which include the field of psychiatry and psychology. Anyone who reads this book is sure to want additional knowledge as to what happens in other industries not touched upon by DR. MCCORD. Nor is industrial medicine anything new. It was mentioned in the early Egyptian tablets. But it remained for modern medicine to provide the protection which is now available for our industrial life. Finally, the book is easy reading and has been written with exceptional literary charm. DR. MCCORD has succeeded to an unusual degree in popularizing a highly technical subject."

Industrial Health on the Casualty List

IT IS interesting to watch the trend of newspaper comment regarding John Lewis' demands for the coal miners. A month ago the news items, editorials and syndicated comments on this subject coming in—almost in hundreds per day—from the press clipping services were unanimous in their mention of John's "royalty plan." By the end of April, however, they were almost as unanimous in having substituted for the word "royalty," the term "health and welfare fund," although there are an increasing number of statements to the effect that "Lewis wants adequate safety regulations enforced and company-paid health insurance." John's exhibit "A" is the "plight of the miners" who, he contends, do not have the benefits of even workmen's compensation, this being compulsory in only 12 coal-mining states, while it is elective in 13 states, with only seven states having coverage of occupational diseases. "Since 1906 almost 2,000 coal diggers have died each year in dim, gas-filled pits. Since 1930 an average of some 67,000 miners have been injured or blinded by accidents, silicosis, asthma and rheumatism." "Certain people have tried to argue that bituminous coal dust is good for a man's lungs." "The medical compensation facilities for miners are a disgraceful set-up that cannot be duplicated in any industry." "The state law required 6,296 inspections of Kentucky mines in 1944, but only 720 inspections were recorded. . . . Federal inspections of 144 mines showed that 97% had not been 'rock dusted' and that 84% had inadequate air, which meant there was 'a damn good chance of an explosion at any time.'" The mine operators counter with statements that safety devices are not used by the miners even when they are provided: "The safety history of the industry is replete with strikes, legislative battles, and plain refusals of the mine workers to accept closed lights, smoking regulations, safety hats and shoes, new rules or any rules whose only purpose is the safety of the employee." The U. S. Bureau of Mines is quoted as favoring much better safety and health conditions for coal miners in general. Whatever John's strategy, and however uncomfortable his methods, the workers in the plants which use the coal his workers produce would be striking too if their working conditions as to safety and health, and compensation for injuries and occupational diseases, were as bad as he says they are in the coal mines. His characterization, of course, is too general; many mines are far advanced in their health and protection measures. Unfortunately, however, others are not. In whatever degree any of them are inadequate they should be improved. And—to give the Devil his due (which if it were given him at this writing would be in terms of tar and feathers)—John is right in the principle that such improvement should be accomplished wherever it is necessary. The objective is inherently a fine one. The trouble is that its fineness is being prostituted to the ends of political chicanery—wherefore industrial health as it is represented in this controversy is being very badly kicked around.

Red comfort

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COMMENT and OPINION

THE organized effort to control tuberculosis among American wage-earners and their families during the past 35 years has been eminently successful, but it is still far short of its goal—virtual eradication of the disease. Modern facilities for case-finding, treatment, and rehabilitation have not been put to their fullest use. This is particularly true in the colored population, where the hard core of the problem now lies. Tuberculosis would be almost completely eradicated in our country in the near future if existing knowledge and facilities were well utilized.

—Statistical Bulletin, Metropolitan Life Insurance Company, November, 1945.

THE American Psychiatric Association and the National Committee for Mental Hygiene jointly announce the appointment of CAPTAIN FORREST M. HARRISON (MC), U.S.N., as Director of a newly established Psychiatric Personnel Placement Service. The service is designed especially to help physicians and psychiatrists make contacts with training opportunities such as residencies, postgraduate courses and fellowships, and to aid institutions in locating suitable candidates for appointments. Physicians interested in psychiatry are invited to send in full biographical statements including personal data, education, training, experience and special desires, in order that this service may be of the greatest possible assistance to them. Deans of medical schools, superintendents of hospitals, and directors of industrial organizations, clinics and others employing or participating in the training of psychiatric personnel, are invited to submit full information regarding available positions and courses, including financial details. Foundations, universities and other agencies are asked to report pertinent fellowships in psychiatry, psychosomatic medicine and child guidance. Inquiries should be addressed to CAPTAIN FORREST M. HARRISON (MC) USN, National Committee for Mental Hygiene, 1790 Broadway, New York City 19.

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Free Doctor Service?

UNFORTUNATELY some people never learn. They have not learned the lesson of thrift and of saving, they have not learned you cannot get something for nothing, and they have not learned why we fought this war; they do not know that the people in our enemy countries also wanted something for nothing and they got it. They had medical insurance, unemployment insurance and were taken care of from the cradle to the grave, but would you trade places with those people today? A certain small group now wants the government to go into the insurance business. They are taking advantage of the teachings of the insurance companies and at the same time they cater to those who want something for nothing by telling them the government will pay their doctor bills. It is this selfish class who have never learned they cannot get their doctor bills paid by the government without giving up something which in most cases is worth more than the doctor bill. As it is now, you are free to choose your own doctor, and you pay him for his services. Some doctors charge what they think you can stand which is fair enough for the poor but unfair to the rich. If this Wagner-sponsored socialist medical bill were to become law, the government would pay your doctor bill in case you get sick, but whether you get sick or not, your income tax would be raised about 6%. A large part of this extra income tax would go to buildings full of bureaucrats. Your doctor would be appointed not for what he knows but for who he knows, the doctor would be paid whether he served you or not, and you would go to the doctor assigned to you whether you like him or not. Backers of this bill say you would have a free choice, but don't fool yourself, only those who cannot learn will be lulled into any false promises.

—Weekly Bulletin, Jackson County Medical Society, Kansas City, Missouri, March 30, 1946, quoting GEORGE A. BIRDSALL, in *Indianapolis Star*.

Disease Control in Florida

A STATEWIDE campaign to locate and eventually control disease in industry was launched early this month by the State Board of Health in cooperation with the Florida In-

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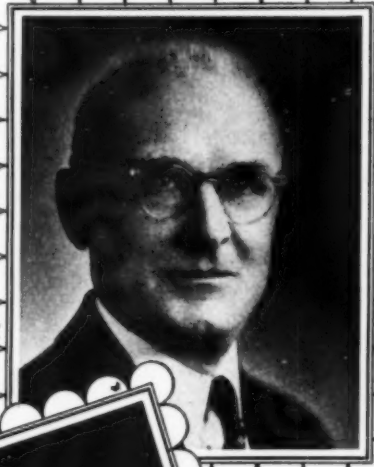

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Industrial Dermatitis with Paraprol "National"

1. Parkes, M., Ind. Med., *14*:565-566, July 1945. 2. Dobbins, T., *Ibid.*, *15*:13, January, 1946.

DURING WORLD WAR II, the need for effective control of industrial dermatitis became more urgent than ever; and countless remedial and preventive preparations made their appearance. Of these, many offered merely the inert protection of various ointment bases and oils. Others cleansed the skin, but exerted an undesirable de-fatting or drying activity. Still others, though effective in cleansing or protecting, had little power to control the itching of the irritated skin.

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dustrial Commission. The program is an outcome of an Act passed by the legislature last spring which made Florida the thirty-first state to inaugurate a compensation law for occupational disease in industry. That Florida has specific problems in industrial hygiene must be certain in view of its fast growing industries, but only the survey will reveal the extent and scope of these problems. With the help of the U. S. Public Health Service, sanitarians from the State Board of Health, local health units, and factory inspectors of the Industrial Commission were given basic training for the inspection job. It is expected that the survey will be a forerunner to the establishment of a division of Industrial Hygiene in the State Board of Health in connection with the Bureau of Preventable Diseases. A physician specializing in industrial hygiene should be of inestimable service to private physicians in diagnosing occupational diseases. The types of service which the State Board of Health can render to the public in the field of industrial health are varied and extensive, but may be summarized as (1) evaluation of the industrial environment and recommendations regarding needed correction of conditions found to be detrimental to health; (2) consultant service to medical supervisors, private physicians, compensation authorities and other state agencies regarding illnesses affecting workers; (3) provision of necessary laboratory services of both a clinical and physical nature, and (4) promotion of programs for adult hygiene in industry. Industrial hygiene is merely the science of the preservation of the health of workers, therefore primarily a program for the conservation of health and the prevention of accidental and occupational disease. Some of the diseases which will be investigated will stem from working environment such as exposure to harmful dust, fumes, gases, vapors, excessive noise, bad illumination, and abnormal atmospheric pressures. Means of controlling such occupational diseases as lead poisoning, poisoning from solvents, and especially skin diseases peculiar to citrus workers will also be studied.

—WILSON T. SOWDER, M.D., State Health Officer, in *J. Florida M.A.*, February, 1946.

Definitely Psychopathic

THE world has long suspected, of course, that the founders and leaders of Germany's Nazi Party were definitely psychopathic. Positive proof is afforded by the recent study of the brain of Dr. Robert Ley, who committed suicide shortly after his capture by American troops. Neuropathological research found that the frontal lobes showed definite signs of a long-standing degenerative process, which undoubtedly accounted for his aberrations in conduct and emotions. Normally, frontal lobes are necessary for complex types of thinking and proper development of the "social sense."

—From *Hospital Topics*, 24:2, 19, February, 1946.

Wrecked by the "Gimmies"

THE government of New Zealand is seriously considering whether that country's free physician service will be continued. The record of New Zealand's compulsory health insurance reveals that the cost of disability pensions and medical care benefits tripled between 1940 and 1945. The rise was due to increasing costs of various classes of benefits, as well as to the addition of new classes of medical benefits in 1941 and 1942. Some types of benefits, namely, permanent and temporary disability and maternity benefits, show a fairly constant cost level over the last few years. On the other hand, hospitalization, medical care and pharmaceutical, and supplementary medical benefits have shown substantial increases almost every year since their inception. This shows that New Zealand has been unable to keep the costs of operation of compulsory health insurance on an even keel, owing to factors not strictly of a social nature. One of these is the human tendency to take advantage of benefits offered under a compulsory system; another is the political pressure for increases in rates and duration of benefits, as well as for increase in coverage. Both these factors are difficult to evaluate in terms of statistics, but

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they exist. New Zealand has had compulsory health insurance since 1939, and in these years of trial its operation has become more costly with every year that passes. This is something for America, now burdened with a Federal debt of nearly $300 billion, to think about when it considers entering the field of socialized medicine.

—*Weekly Bulletin*, St. Louis Medical Society, March 22, 1946.

Eye Care and Protection

A SURVEY made early in the war by the National Society for the Prevention of Blindness showed that industry in general did not understand the importance of eye care and eye protection. To meet this need an educational program was developed, outlining what should be done, why it should be done, and how to do it. The program was brought to the attention of Mr. Donald Nelson, then chairman of the War Production Board. He quickly recognized the importance of better vision for better war production, and the program was taken over by the War Production Board. In his letter to American industrial executives requesting cooperation, Mr. Nelson said: "When a job needs vision, a man can work only as well as he can see." The War Production Board was joined by the U. S. Public Health Service, War Manpower Commission, U. S. Department of Labor, Office of Vocational Rehabilitation, and U. S. Civil Service Commission as cooperating agencies; and the National Society for the Prevention of Blindness was engaged by the War Production Board to prepare material and to direct the program. Advice concerning visual conditions went to 25,000 industrial executives. As a result, six government agencies and the employers of 8,000,000 workers are cooperating to safeguard eyesight in their plants. Studies among these industries included individual attention to the eyesight of workers, proper lighting, and the use of color in painting workrooms and machines. Eye care of employees includes examination of eyes and provision of glasses for those who need them. If there is any limitation in the employee's vision which cannot be corrected by glasses, he is assigned to work in which this limitation will not interfere with his efficiency or earning capacity. The most amazing information gained from the industrial investigation is the very large number of persons who thought they were seeing "all right," when, as a matter of fact, their vision needed the benefit of glasses. In general work, four out of every 10 workers were found to need glasses, while, in office work and in the needlecrafts, six out of every 10 needed this help.

—From "Can You See What You Are Doing?" by CHARLES P. TOLMAN, in *The Sight-Saving Review*, 14:4, Supplement, 240.

Nutrition Town Meeting

CHICAGO'S Nutrition Association has selected April 10, 1946, for its second annual Town Meeting on Nutrition to be held at the Peoples Gas Light and Coke Company Auditorium, 122 South Michigan Avenue. The Theme for the day's program is "Nutrition Advancements During the War Years Applied to Present Day Living." Dr. Ancel Keys, University of Minnesota, Mary I. Barber, Kellogg Company, and Dr. W. Franklin Dove, QMC Subsistence and Research Laboratories, will appear on the morning program. The afternoon session will be devoted to the practical application of the new knowledge to everyday living. The evening program will be on "Nutrition a World Problem." Dr. Theodore Schultz will speak on "Food Supply as Related to Nutrition in the United States." The second talk will be on "Food and Agriculture." Dr. C. I. Reed, Professor of Physiology, College of Medicine, University of Illinois, is president of the newly incorporated Chicago Nutrition Association, an outgrowth of the Chicago Nutrition Committee which carried on educational programs throughout the war. The new Association will carry on this important educational program in the Chicago area.

It's Still State Medicine

THE President has asked for what headlines call, "A law to force insuring of the nation's health." In the debate which is sure to ensue over this proposal, proponents and opponents will be listed categorically as either liberals or reactionaries—if you are for it you are liberal; if you are against parts of it, you are a reactionary. Tens of thousands of hard working doctors who are doing their utmost to carry forward

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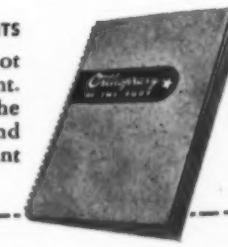

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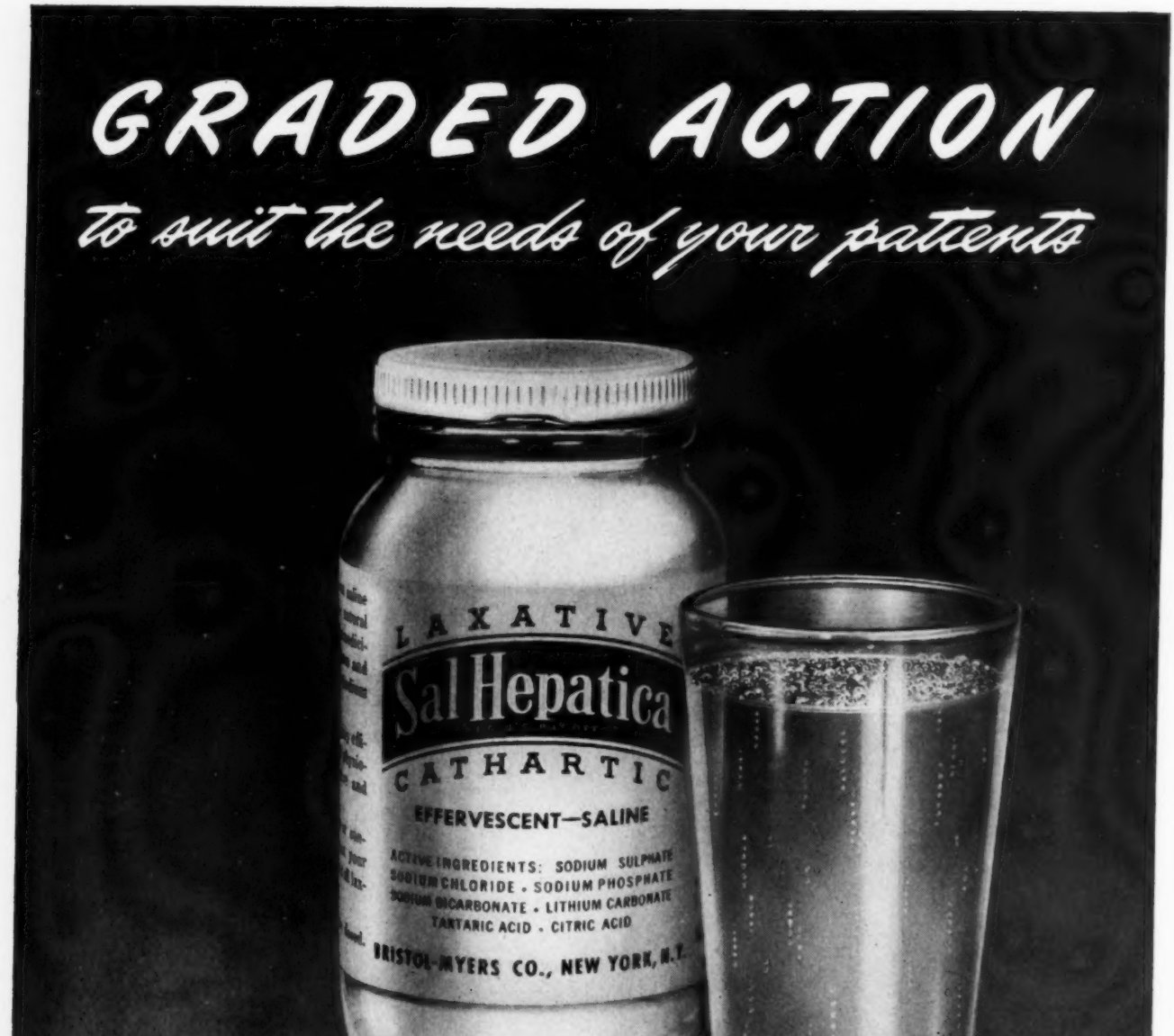

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America's high medical and health standards but who oppose certain parts of the President's program, will be termed reactionary. And yet is it reactionary to point out that when the state compels every individual to contribute a part of his earnings toward support of a public undertaking, that undertaking must inevitably become the property of the state? When the Federal government forces a person to subscribe to a prepaid medical system sponsored by the government, is there any other name for it but "state medicine?" Likewise, is it reactionary to point out the obvious contradiction in the statement that patients will have a free choice of doctors, but doctors will not be compelled to join the program? Suppose the doctor you want is not a member of the state medical system? Indications are that many doctors will not permit themselves to be put on the government payroll unless forced to do so. In other words, in order to have your free choice you may have to pay your medical bill twice—once to the government for a doctor you don't want and again to the doctor of your actual choice. These are some of the questions the "reactionaries" are concerned about.

—*Jackson County Medical Society Weekly Bulletin*, Kansas City, Missouri, quoting *Industrial News Review*.

The Eyes of Industry

THE Illinois Society for the Prevention of Blindness has been active in assisting in examining the eyes of industry, and in the prevention of blindness from accidents in industrial plants, since October, 1943. A representative writes: Up to the first of this month, we have tested a total of 7,322 people employed in 32 plants by small industry in the Chicago area. We define small industry as a plant employing less than 1,000 people. Of this total number of people tested we found an average of 57.87%, with and without glasses, having defective vision of varying degrees. It is interesting to note that, of all the plants tested, 30% are included in the 41 to 50% of defective vision group and 13% of these plants are in the 81 to 90% defective group. Most of the plants that we have surveyed have been very cooperative in arranging schedules for examinations and in the follow-up of our recommendations, and most of them have arranged to have all employees with defective vision given further examination and correction. A radio manufacturer employing approximately 800 people is now retaining an ophthalmologist to make further examinations in his plants. The management paid the physician's examining fee and also paid up to $10 for glasses. We have been testing this plant each month and as a result their entire personnel is operating at top efficiency with normal vision. They have not completely fulfilled our lighting recommendations because they are now making plans for a new and modern building with light intensities to be set at recommended levels. Their goggle program is not set up for complete eye protection, as we have suggested to them, but they do compel operators to wear eye protectors where the hazard is great. This is, of course, contrary to our belief, as serious eye injuries usually occur where they are not expected. A recent survey of a large office group showed 70% with normal vision. The defective group is being examined further, and corrected, the entire cost being paid by the management. This same firm has made arrangements with other agencies for a complete health program, including examination of heart, lungs and dental x-rays. They are also making a complete change of their lighting equipment to give the required levels for better vision. In a small shop where they machine brass and steel valve castings, our examinations showed 47% with defective vision. They are following our recommendations to the letter, and have already reduced their accident-frequency rate up to 15%. All of their employees who were found to have visual defects were sent to an oculist to be corrected. They have instituted a complete goggle program with central control and have also corrected their lighting errors. The interior of the entire shop has been painted a soft white to increase reflective lighting and visual efficiency. I have given the above as typical illustrations of some of the programs that we have been able to accomplish in the Chicago area. There are, we understand, approximately 1,500 small plants in the state of Illinois, and, judging from the number of people we find with visual defects, industry in general is considerably handicapped and not operating at top efficiency on account of them. We use the Bausch & Lomb Ortho-Rater in making our

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examinations and besides the operator of the Ortho-Rater we employ a safety engineer to check on lighting and other working conditions and submit his report, in addition to the report on eye conditions, to the management.

—*The Sight-Saving Review*, 15:2, 112. 1945.

Bad Medicine

A HIGH public official in the present labor government of Britain has characterized the medical service given the industrial classes in his country as "a tragedy of incompetence." Britain has a state dominated medical system similar to that currently advocated for this country. Another noted British authority, Sir Kingsley Wood, states that the National Health Insurance system has made the English into "a nation of medicine drinkers." The doctors in Britain cannot be blamed for the inadequacy of British medical care. The trouble has been pointed out often by qualified observers. It is rooted in the system itself, which has failed miserably in every country that has tried it. In Germany, the sickness rate after introduction of health insurance trebled from 1885 to 1930. In England, number of claims increased by almost 50% in a six-year period. One writer, in commenting on conditions in England, says doctors are overworked by people trying to "get their money's worth," and adds, "Many of them have to see anywhere from 30 to 60 patients a day. . . . Furthermore, the Ministry of Health got the druggists to make out a list of cheap drugs. The Insurance Committees which administer the medical benefits, have tried to force the doctors to use the list. . . . It is small wonder that under such circumstances in 1936 at least 600,000 workers failed to register so they could be eligible to see an insurance physician even though they had paid their health insurance taxes." The United States should steer clear of this kind of medicine.

—*Weekly Bulletin*, St. Louis Medical Society, March 29, 1946.

One Way to Heaven

WERE it not for the fact that the matter is assuming serious proportions, one could laugh at some of the criticisms and accusations made concerning the practice of medicine and the individual practitioners. Here is what happened at a recent lecture. The subject of the talk was "Drugs" and was beautifully presented by a pharmacist. During the discussion which followed, a preacher aired his views, not only about drugs but more particularly about those who prescribe them. The gist of his remarks was that doctors are too conservative; they are prejudiced against anything new, especially if the originator of a new remedy happens to be a layman. This terrible state of affairs, he said, prevents patients from getting the benefit of new and better methods. He then stated that it was a well known fact that doctors fought and scrapped among themselves, would not pull together, and disagreed as to the particular medicine to be used in this case or that. He wound up by saying, "How is a layman to judge what is right and what is wrong?" Up jumped Dr. Sam Adams, "Preacher, I'll answer your comments. We doctors will all agree on standard methods for treating the sick just as soon as you preachers agree on the one and only way to get to Heaven." And Sam sat down. Then I took over. "Preacher, how would you like to wear a fresh muskrat skin on your nose and chest all the time?" He indicated his dislike for such a procedure. "Well, if we doctors did what you seem to think is correct, many people in this state would have a muskrat skin on right now. A nice old lady made a special trip to my office to tell me about that wonderful remedy, and she had a clipping from a country newspaper which stated that Farmer Blank had cured his asthma that way." "But that's ridiculous," the preacher said. "I'm not talking about that kind of thing." "But," I replied, "some of the things you, with your lack of medical training, think are perfectly logical and reasonable we know are just as ridiculous as the muskrat business appears to you." I happen to know the preacher in question. He is a well-educated, broad-minded man, and an all-round tolerant, good fellow. I really get discouraged when I stop to think that if such a person cannot see that the very conservatism, the very disagreements we doctors have, to which he objects, are in reality

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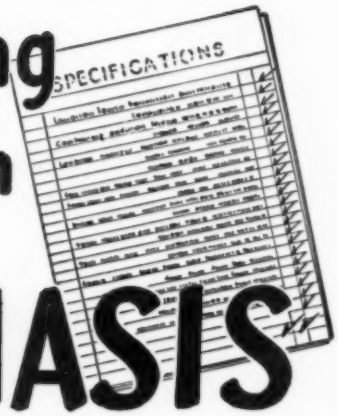

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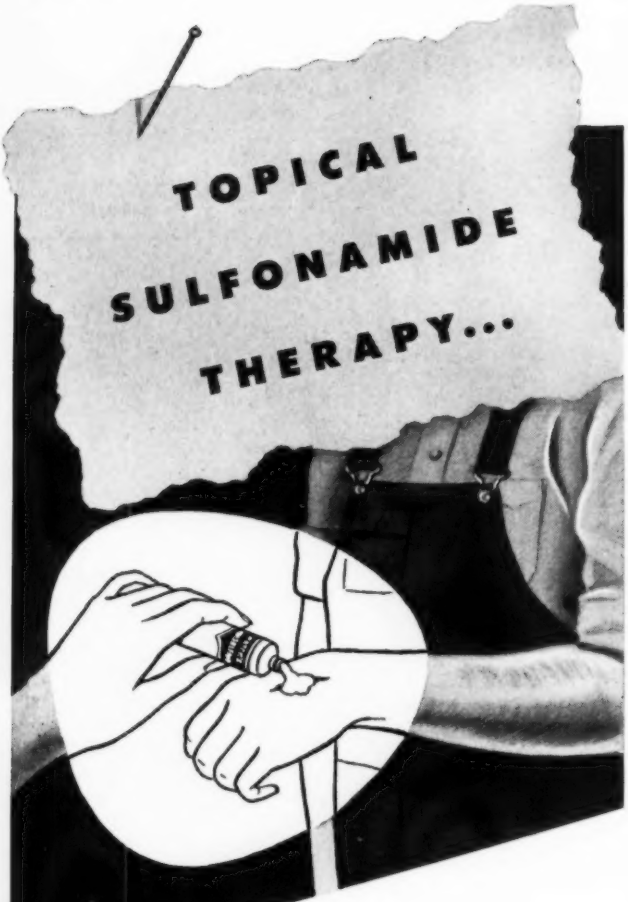

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the public's safeguard against danger, and are basic principles toward real progress, what chance have we of being correctly judged by the majority of people who are not educated and tolerant? And if the members of a profession who preach about seeing the mote in your eye can't see their own, how can we expect others to do so? Is this business of disagreements confined to the medical organization? Dr. Adams showed clearly that it exists among the preachers. I seem to have heard of an American Federation of Labor, and also a C.I.O. Wasn't the latter group formed because certain members of a labor organization disagreed as to standards? Are so-called jurisdictional strikes not caused by disagreements between labor unions? Do all capitalists agree as to how furniture, for example, should be manufactured? On analysis, we find that what the preacher told us was wrong with medicine exists in every business or profession or government which comes under consideration. I personally feel that these disagreements, these so-called wranglings, are a fine thing. I believe that they are the vitamins and minerals without which progress would be at a standstill or die. Doesn't a disagreement between scientists cause each one to do some extra experiments, some more work? And even if the reason which prompts them is to prove some other fellow is wrong, isn't progress the result? When doctors thoroughly agree on every point, on every drug, on every curative method, I want to quit and take up farming. By the way, does every farmer agree on how to make good corn—be it the solid or liquid variety?

—FRANK C. METZGER, in *J. Florida M.A.*, February, 1946.

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ALL CASES of legal blindness in New York State must be reported to the Commission for the Blind of the State Department of Social Welfare in accordance with a recent amendment to the act creating the New York State Commission for the Blind. It is now the duty of every health and social agency, attending or consulting physician or nurse to report to the State Commission for the Blind, in writing, the name, age and residence of persons who are blind within the definition of blindness and to furnish such additional information as the Commission shall request for registration or prevention of blindness. This law supplements the mandated responsibility of the Commission for the Blind, Section 8774, Title 24, Chapter 3 of the Unconsolidated Laws to maintain a complete register of the blind in the State of New York which shall describe the condition, cause of blindness, capacity for education and industrial training of each, with such other facts as may seem to the Commission to be of value. Data as required by the Commission for the Blind will further the State's effort to prevent blindness through a comprehensive knowledge of the facts relative to the causes of blindness. This information will also aid in the earlier recognition and detection of cases where remedial measures for restoration of vision are still possible. Likewise, those who may desire the services of the Commission for the Blind will be benefited through acquaintance with the opportunities available to which they are entitled. Legal blindness is defined as total blindness or impaired vision of not more than 20/200 visual acuity in the better eye and for whom a diagnosis and medical findings show that vision cannot be improved to better than 20/200; or who has loss of vision due wholly or in part to impairment of field vision or to other factors which affect the usefulness of vision to a like degree. Apparent blindness should also be reported even though not based on an eye examination. For reporting blanks, address the Commission for the Blind, 205 East 42nd Street, New York 17, N. Y.

Mass Health Education

A FEW principles of mass education in industry are rising to the surface. Men and women who have worked in the field agree that above all the approach must be simple; an elaborate program no matter how good it may appear on paper will be doomed to remain there. Printed material must not only be simple and brief, if it is to be read, but must be colloquial in style and related to the problems and background of the audience for which it is intended. It has been found further that even the best of programs if handed down from the front office are not always

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"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area —because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

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(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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accepted with open arms by employees. An effective program in one way or another must enlist the active participation of the workers so that it becomes their own. Finally, such a program, even when initiated and sponsored by a voluntary agency, should have a close tie-up with public health treatment and service facilities and the medical profession. Suppose, then, that such an ideal program is put into operation in a firm or plant, how could its effectiveness be evaluated? Only by the practical steps for health protection and treatment taken by management and by workers collectively and individually. Naturally, the heightened health awareness acquired by reading literature and seeing movies is all to the good. But if, for instance, a group in a plant has read, discussed and assimilated information on the prevention of colds, the real test of achievement must be whether draft hazards in the plant will be eliminated and heat from steam radiators will be humidified. If the educational campaign against the venereal diseases is successful, then more employees will seek examination and treatment, job discrimination against noninfectious cases of syphilis will be eliminated, and fears and prejudices about working alongside an infected person will no longer exist.

—From "Notes on Industrial Cooperation," by PERCY SHOSTAC, in *J. Social Hygiene*, November, 1945.

Oral Disease and Absenteeism

DISEASES of the teeth and gums were blamed for frequent work absences among industrial workers, at a conference called by the Tennessee State Department of Public Health to consider problems of industrial dentistry. The two-day meeting, held in Nashville December 18 and 19, was attended by representatives of the U. S. Public Health Service, Tennessee Valley Authority medical staff, state health department, and state dental and medical associations. Precipitating cause of the conference was a study of absences in Tennessee plants, carried on by the Department of Public Health for more than two years, in which it was found that infections of the teeth and gums rate high among the factors causing one-day-or-longer work absences. During the period studied (1944-45), workers in four Tennessee plants lost 1,267 work days due to diseases of the teeth or gums, an average of .212 days per employee. This compares with an average loss of .063 days per employee in a public utility reporting absences from the same cause over the reporting period 1938-1941. The study report, prepared by Dr. Ruth R. Puffer, Director of Statistical Service, Tennessee Department of Public Health, points out that dental care for the correction of defects is relatively unavailable in the state, and that the relatively high industrial absence rates are indicative of a dental problem in the adult population. State and national aspects of dental health as they affect industrial productivity were considered in the conference, the first such meeting called by a state health department. Participating in the program were Dr. L. D. Heacock, Chief of the Dental Unit, Industrial Hygiene Division, U. S. Public Health Service, who spoke on industrial dental health services in the United States; Dr. W. M. Gafafer, Chief of the Statistical Unit, Industrial Hygiene Division, U. S. Public Health Service, whose subject was "Utilization of Absentee Data in Program Planning"; Dr. H. H. Hudson, Director of the Industrial Hygiene Service, Tennessee Department of Public Health, describing the State industrial health program; Dr. Puffer, reporting "Absenteeism Due to Diseases of the Teeth and Gums in Tennessee Plants"; Dr. C. L. Sebelius, Director of the Dental Hygiene Service, Tennessee Department of Public Health, on the "Industrial Dental Health Program." Dr. Sebelius acted as chairman of the conference. Others present included Dr. E. L. Bishop, Medical Director, Tennessee Valley Authority, and Drs. Merton Derryberry and Joseph Hufstedler, members of his staff; Dr. O. A. Oliver, Chairman of the State Public Health Council; Dr. M. F. Brown, Assistant Commissioner of the State Department of Public Health; Dr. Walter Morgan, Chairman of the Committee on Industrial Dentistry, Tennessee Dental Association; Dr. Don Clawson, President of Meharry Medical College; Miss Elizabeth Newbert, Herbert Walworth, and Arthur Anderson, of the State Industrial Hygiene

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Service; Dr. C. B. Tucker, Dr. Pratt Ringland, Miss Dorothy O'Brien, Dr. Alex Shipley, and Miss Sara Lou Hatcher, of the Tennessee Department of Public Health. Plans have been made for cooperative action by the State Dental Society and the Dental Hygiene Service to initiate and carry on a dental service in industrial plants of the state. Dental health education will be stressed. The study on absenteeism due to dental causes is being revised with the cooperation of Dr. Sebelius, Director of the Dental Hygiene Service of Tennessee, and will be published soon.

—*Industrial Hygiene News Letter*, January, 1946.

South Carolina

ON THE request of several managers and one plant physician in a group of textile plants, the Division investigated a new hazard. The complaints were consistent in giving these symptoms. Some employees, 15 to 20%, working in either the cloth room or unbaling room were subjected to attacks of hayfever, with violent sneezing and watering eyes, and to a skin irritation, with their hands and arms stinging and itching. The reactions take place immediately on exposure and disappear when the workers get away from the contact and bathe the exposed surface. Since the employees affected worked in either the cloth or unbaling rooms, careful surveys were made of all materials and operations. The only recent change was the substitution of used burlap for either new burlap or cotton osnaburg as a cloth wrapping. The used burlap was examined and found to contain castor bean and hulls. The stamping on the material showed this product was shipped from a South American country to this one and the burlap resold to the local mill because of a shortage of other wrapping cloth. Castor bean pomace dust is a well-known respiratory irritant. Many cases of asthma have been known to occur in the vicinity of plants handling this material. The recommended control was to substitute a new material for the used, or clean the used burlap. For those receiving cloth packed in used burlap, it was recommended that only those immune to castor bean dust be assigned to handle these bales and to keep the material confined to as little space or few rooms as possible. Respirators have been tried, but because of clothes contamination and the potency of this foreign protein to produce reactions in sensitive persons, they were not totally satisfactory.

—*Industrial Hygiene News Letter*, February, 1946.

The World's Saturday Night

THE *American Lutheran* seriously calls attention to some prophecies of the New Testament pertaining to the consummation of the world and Christ's return to judgment. The editor quotes from a chapter in Peter: "The elements shall melt with fervent heat." "Up to the present time," the article says, "we could not conceive of the reality of that prediction, but when even steel can now be vaporized with atomic energy, it sheds new light on this prophecy. From these and many eschatalogical prophecies in the New Testament, we cannot but feel that we are living in the world's Saturday night."

—From *The Kablegram*, No. 1, 1946.

That Security

RELIABLE observers report that the Rhode Island Sickness Insurance Fund (the only state system in existence) will be insolvent in 1947 if present disbursements and declining contributions continue. A million-dollar deficit this year is predicted. Unless we're poor guessers, the crafty hand of politics has upset the best laid plans in "Little Rhody." Give more and more, for less and less never ceases to be a popular slogan for the office-holder to follow. But it doesn't add up too well from an actuarial point of view. So then the tax mill has to start in grinding again. Mr. Truman and Messrs. Wagner, Murray and Dingell, please copy and note the above lesson.

—From *Ohio State M. J.*, 41:12, 1152, December, 1945.

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Salt and High Blood Pressure

A CLEARER understanding of high blood pressure may result from preliminary rat experiments at the University of California by Dr. David M. Greenberg, professor of biochemistry, and Elizabeth M. Cuthbertson, medical student. The experiments clear up to a degree the understanding of the effects of salt in the diet on high blood pressure. It has been known that a diet high in salt content is deleterious in cases of high blood pressure due to kidney disease. Until now the cause for the damage has been attributed to high intake of sodium, which is combined with chlorine as sodium chloride to make table salt. The scientists' experiments indicate the damage may be done by chloride rather than sodium. Rats deficient in chloride were found to utilize their food inefficiently and gained less weight per unit of food. It was found that the chloride-deficient rats have an increased amount of chloride in the heart, which indicates the deficiency causes an overworking of the heart. Deficiency of chloride was also shown to produce kidney damage. The experiments were conducted with artificially radioactive elements produced in the atom-smashing cyclotron.

—California & Western Med., 64:1, 56, March, 1946.

Turning Backward

A NEW ZEALAND doctor frankly describes the shocking breakdown in medical standards in that country as a result of state medicine. Doctor G. M. Smith, medical superintendent of Hokianga public hospital, states "that of every 100 patients who consult a physician today only 25 are able to benefit from his advice; that city physicians send twice as many patients to hospitals as they did before hospitalization became free and doctors' consultation fees were guaranteed; that the nation is becoming addicted to the habit of swallowing valueless nostrums from bottles, and that since the great growth of hospitalization there is no efficient control of hospitals, which are publicly financed in this country, and no audit of their results. . . ." What has socialized medicine in New Zealand done to the doctors themselves? Dr. Smith declares that, "The National Medical Association and the politicians of both parties have gone far to foul the name of the profession to which I have the dishonor to belong." The New Zealand state medical system has brought great inflation of the earnings of doctors which are easily concealed from the administration; state stimulus of the practice of collecting large sums for little medical work; disinclination to take difficult cases; use of the system of paying mileage charges to the country doctors to make illegal gains. Before assuming that this country is too smart to make the errors that in New Zealand have demoralized the medical profession and threaten the health of the people, we will do well to scrutinize our own plans to set up a politically dominated medical system. Doctors have warned repeatedly that proposals now in Congress would have a disastrous effect on American medical standards.

—Jackson County Medical Society *Weekly Bulletin*, Kansas City, Missouri, March 2, 1946, quoting from *Industrial News Service*.

Advancing Age

THE real enemies of advancing age, the diseases more common in elderly people, are insidious, slow to develop chronic diseases. Diseases of the joints, rheumatism, arthritis; diseases of the vascular system, the blood vessels and the heart; diseases of the glands, diabetes; cancer, which is common to middle age as well, mental disorders. To these must be added fractures from falls and accidental injuries. Long before actual symptoms are apparent in most of these chronic diseases, there has been a period during which the damaged part or organ has been able to compensate for damage and loss of function and thus to keep the patient from having his attention drawn to the ailing organ or part of the body. The actual symptoms, the pain and discomfort, the warning signals, that make us conscious of disease often come too late, or after the power of self defense or repair is gone. This but emphasizes the importance of medical guidance and supervision as a routine part of our preparation for happy, useful age. Knowledge concerning adult hygiene; information concerning diseases of aging; med-

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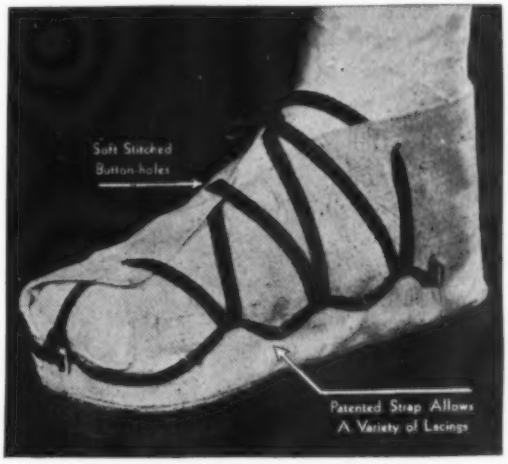

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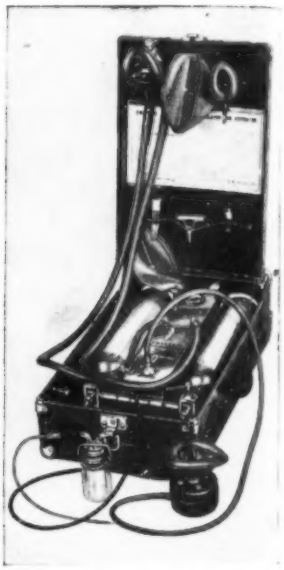

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ical advice from doctors; these are valuable and may be made helpful, but these are not enough to insure the highest possible degree of health. There must be the recognition and acceptance of responsibility by each individual. Life does not owe us health any more than life owes us success. Health is a privilege, an opportunity. We must strive for health just as we strive for success. We are, in a very large measure, the architects and builders of our own health, especially in the years of our mature and active life.

—*Monthly Bulletin*, Indiana State Board of Health, 49:3, March, 1946.

Agents of Government

THE physician in the Wagner Bill becomes, rankly and openly, an agent of government, an employee of government. The choice of the patient whom he is to serve, the method by which he approaches the problems of the patient, the education through which he prepares himself for his profession, the relationships which he maintains with other agencies, all these and their implications are henceforth to be subject to governmental regulation. The freedom of the profession is to be sacrificed, thereby re-defining professional responsibility and effacing effectively the distinction between the personal services given by a professional man and the impersonal services given by any other employee. Hours of service will, no doubt, be defined for the physician as they have already been defined for other employees. Fiscal arrangements will favor the development of attitudes characteristic of commercialism. Controls will be exercised over medical practice much as they now are over an industrial plant. As the dignity of the patient is sacrificed, that sacrifice will mean also the sacrifice of the physician's dignity and of his elevated ethical responsibility. (A statement on behalf of the Catholic Association of the United States and Canada in collaboration with the Department of Social Action, National Catholic Welfare Conference.)

—Jackson County Medical Society *Weekly Bulletin*, Kansas City, Missouri, March 2, 1946.

CURRENT ARTICLES of QUALITY

Cutaneous Manifestations

J. MURRAY KINSMAN, M.D., "Cutaneous Manifestations of Systemic Disease," in *Kentucky Medical Journal*, 44:3, 120-124, March, 1946. Summary: "(1) Excepting for parasitic and other local infections, most skin diseases are associated with systemic disturbances. Conversely, many primarily systemic diseases are accompanied by cutaneous manifestations. (2) In some diseases the cutaneous manifestations are of relatively secondary value from the diagnostic point of view. In many, however, they are of prime importance from the standpoint of establishing the diagnosis. Examples are the contagious diseases, meningococcemia, the purpuras and allergic states. (3) At times, certain diseases which do not usually exhibit manifestations, may be accompanied by an eruption. Unless this fact is recognized, the picture may be unnecessarily confused. Example: Infectious mononucleosis is sometimes accompanied by a rash resembling measles, scarlet fever, meningococcemia, or secondary syphilis. (4) Besides its morphology, the distribution and manner of spread of the rash is sometimes of diagnostic importance, as in typhus fever versus Rocky Mountain spotted fever. (5) Sometimes the rash is ephemeral, and because of the fact that it may be present for only a short time, the skin should be inspected frequently. An example of this occurs in dengue. The importance of frequent inspection of the skin is also emphasized by the fact that the rash may not occur in the beginning of the disease, and unless frequent inspections are made the diagnosis not only may be overlooked, but may be made only after serious complications have developed as for

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*Kovacs, R.: Electrotherapy and Light Therapy, 1942, p.153.

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example meningococcemia. (6) The frequency of cutaneous manifestations in systemic diseases emphasizes that most diseases are not strictly localized in their involvement but affect all the tissues of the body to a greater or lesser degree."

Mental Problems

P. J. MOORAD, "Mental Problems Affecting Industrial Workers," (*Conn. State Med. J.*, 9, 513-518, July, 1945); author's summary in *Industrial Hygiene Digest*, February, 1946: "Industry has among its employees a surprisingly large number and variety of mental illnesses which handicap efficient operation of a plant. The major nervous and mental difficulties are described with some emphasis on the psychology of the returning veteran. It is shown that the men properly selected for the positions of leadership, after psychiatric orientation and training, can usually recognize and correct the trouble at the source, or if necessary, pass the problem on to the industrial psychiatrist for solution."

"As Old as His Arteries and Veins"

JOHN J. O'NEILL, "Science: Conditions of Veins, not Arteries, Seen Key to Age," published in the *New York Herald Tribune*, April 7, 1946. Text: "The almost universal belief that a man is as old as his arteries may have to be changed to one that the condition of a man's veins also determines the state of his vitality. This shift will be caused by recent researches which indicate that the veins can conceal conditions as dangerous to life and health as those of the arteries. The veins have been an almost neglected field for scientific research, but recent inquiries are likely to cause them to receive an increasing amount of attention, since they indicate an interesting solution to some medical mysteries. They may explain why cures were not obtained from treatments which, from logical reasoning, should have cleared up all symptoms of disease. Dr. W. C. Hueper, of the Warner Institute for Therapeutic Research, presented at the recent meeting of the American Society for Experimental Pathology, held at Atlantic City, the first experimental evidence of the course followed through the body of an infection that starts in the teeth. Using animals as subjects, Dr. Hueper implanted germs in the root canals of healthy teeth and observed that in the resulting focus of infection germs of many kinds held a convention, newcomers joining the ranks of those injected. The germs did not remain at the roots of the teeth but traveled through the blood vessels eventually attacking the walls of the jugular veins where they set up a state of chronic inflammation. It has been a matter of general knowledge to the medical profession that infected teeth cause ill effects throughout the body. It was the general belief that the widespread effects were caused by toxins, or poisonous substances, that were generated in the tooth infections and carried by the blood to other parts of the body. Removal of the teeth was usually advised with the expectation that when the pus sacs were taken out the cause of the trouble would be eliminated. Improvements were usually observed. Too frequently the improvements in the patients' condition were slight, long delayed and of such small magnitude that there was some doubt whether infected teeth had been the cause of the trouble. Dr. Hueper's experiments demonstrate that the doctors were right in suspecting the infected teeth as the cause of the trouble, but that treatment of the teeth did not cover the whole situation because the original infection had spread to the veins and from this point of operation were producing effects just as serious as those resulting from the original infection. Existence of chronic inflammation of the jugular veins as a specific disease entity was recognized by Dr. Otto Meyer, a New York physician, who described it in medical journals in 1937. He declared infections of the teeth and tonsils were its primary cause. Dr. Hueper's researches, however, supplied the first experimental evidence that tooth infections can cause infections of the jugular veins. An exhaustive inquiry into arteriosclerosis, the so-called hardening of the arteries, was made recently by Dr. Hueper, who published his findings in a series of articles in *The Archives of Pathology*. An important net result of his researches is the conclusion that arteriosclerosis is not a disease of old age but is brought about by conditions acting during the major part of life and independent of the aging process. There is a belief generally held in the medical profession that if one should be fortunate in avoiding other diseases causing death

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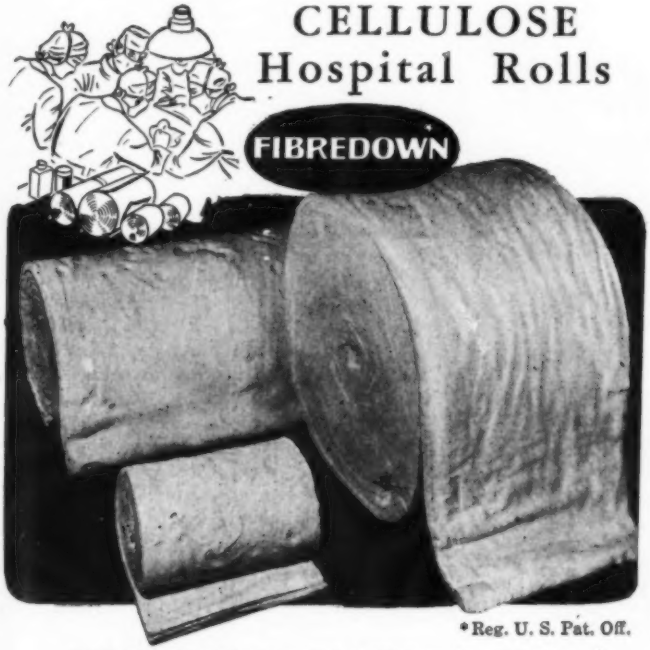

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unusual longevity would not be achieved because every person would inevitably experience the degenerative processes of cancer or arteriosclerosis. A very definite opposite viewpoint is held by Dr. Hueper as a result of his researches. He stated: 'Cancer and arteriosclerosis are definite disease phenomena and not physiologic or pathologic manifestations of old age. The fact that the means at present at one's disposal are defective and in part irrational does not detract from the validity of the foregoing statement but should provide inspiration for the development of improved measures.' In some persons arteriosclerosis develops in the thirties, while many old persons exhibit no signs of it. More than 40% of all deaths are due to diseases of the heart or circulatory system. 'Condition of the arteries and veins determines the physiological age of a person,' said Dr. Huper. When an infection develops in the veins the walls of the blood vessels thicken by an excess growth of the cells, which act similarly to rust or mineral deposits in a water pipe, thereby reducing the size of the opening in the pipe and cutting down the flow of water. In the veins it is the flow of blood that is cut down. The jugular veins are the return pipes for the blood that the arteries carry from the head. With the return pipes clogged, the organs in the head must operate on a lower level of activity on account of the abnormal accumulation of venous blood and an increased pressure on the tissues. Under such conditions, known as chronic phlebitis, headache, nausea, dizziness and fatigue may result. The condition can spread to veins in other parts of the body, particularly the legs, and sometimes the arms. The other organs chiefly affected by the clogged vein are the kidneys and heart. Dr. Hueper is of the opinion that rheumatic infections, particularly in children, may be associated with a phlebitic condition of the veins. Also that arthritis may be the result of a previous rheumatic infection. His recent observations demonstrating how the jugular veins can become infected point the way to preventive measures that will reduce the incidence of such diseases as rheumatoid arthritis, one of the most prevalent diseases. Reduction of the activity of the brain, which exercises so many administrative controls throughout the body, would appear to be a most important fundamental effect of the phlebitic condition of the jugular veins, as it would not only lower the level of mental activity but also the level of physiological activity of almost all the organs. Simultaneously, the infections in the veins distribute toxins which interfere with the normal operations of many organs. Infections of the veins, therefore, can determine the level of physiological activity of the body as a whole or the physiological age, even though the causative disease is not in any way associated with old age."

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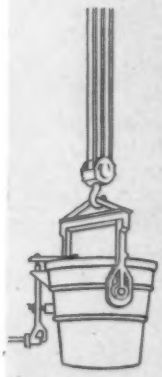

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*Greene, R. R.; Int. Abst. Surg. 74:595, 1942

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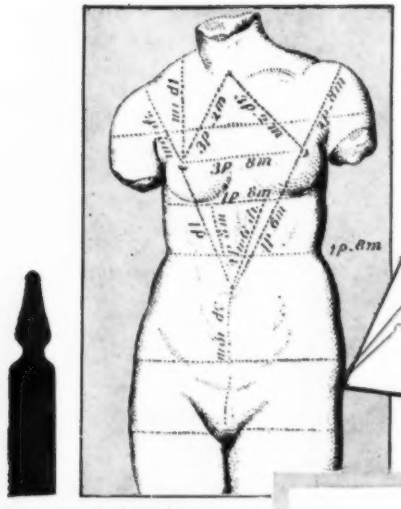

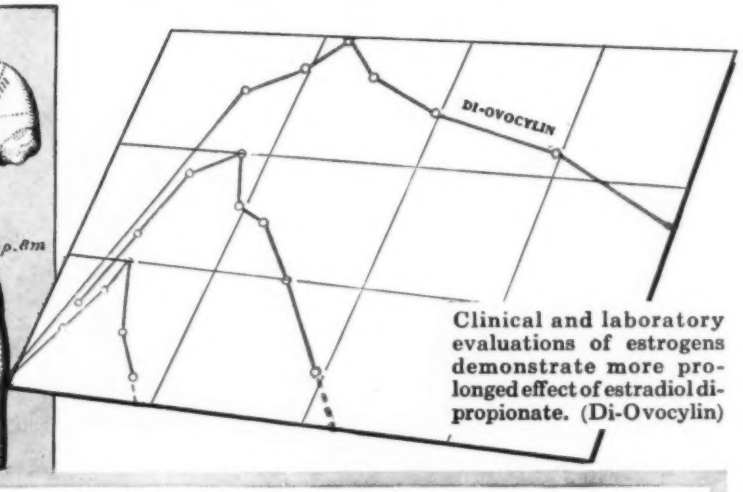

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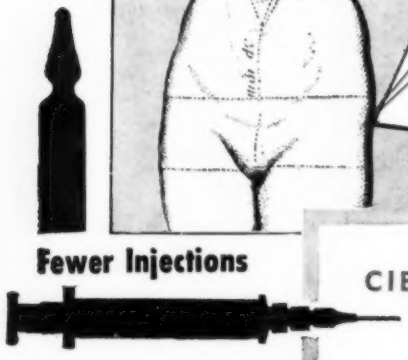

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